Indian River Lagoon National Estuary Program  
525 Community College Parkway S.E.  
Palm Bay, FL 32909  
(321)984-4950

**Partnership Directs Program**

The Indian River Lagoon National Estuary Program is a partnership whose members work to improve the water quality and ecological integrity of the 156-mile long estuary on Florida’s east coast.

The U. S. Environmental Protection Agency (EPA) designated the lagoon as “an estuary of national significance” in April 1990 and included the lagoon in the National Estuary Program.

The Lagoon program began in April 1991, with oversight and funding from EPA. The St. Johns River and South Florida water management districts, the five counties that border the lagoon – Volusia, Brevard, Indian River, St. Lucie and Martin – and representatives of state, federal and regional governments and agencies make up the Indian River Lagoon Advisory Board, a board charged with guiding and overseeing the lagoon’s protection and restoration.

The lagoon program is sponsored by St. Johns River Water Management District and is housed at the District’s Palm Bay Service Center. The St. Johns District oversees lagoon work in Volusia, Brevard and Indian River counties. The South Florida District oversees lagoon work in St. Lucie and Martin Counties.
Section A. General Information Reporting Requirements


Climate Change
CC-3 Provide information to local governments and residents of the Indian River Lagoon region about impacts of climate change and actions they can take to reduce these impacts. Priority: Medium.

Fisheries
F-1 Conserve, protect, restore and manage the finfish and shellfish resources in the Indian River Lagoon region. Priority: High.
F-3 Support and expand research initiatives and coordinated fin fish and shellfish management strategies specific to the Indian River Lagoon. Priority – High.
F-4 Identify, inventory and assess finfish and shellfish habitats within the Indian River Lagoon and implement appropriate management and restoration strategies. Priority – High.

Fresh and Storm Water Discharges
FSD-4 Develop and implement best management practices (BMPs) for the management of stormwater, agricultural and fresh water discharges. Priority: High.
FSD-10 Encourage the proper use of fertilizers, herbicides, pesticides and reuse water. Priority: High.
FSD-11 Educate residents and property owners about the impacts of freshwater and stormwater discharges on the Indian River Lagoon and what they can do to reduce these impacts. Priority: High.
FSD-13 Upgrade existing urban and agricultural stormwater systems to reduce pollutant loadings to the Indian River Lagoon. Priority: High.
FSD-14 Develop and implement appropriate mechanisms to fund and undertake the operation, maintenance and improvement of urban and agricultural stormwater management systems to reduce pollutant loadings. Priority: High.

Monitoring
MON-1 Continue projects related to monitoring the resources of the Indian River Lagoon and address gaps in data as needed. Priority: High.

Public Involvement and Education
PIE-1 Implement and expand public involvement and education projects or programs. Priority: High.
PIE-2 Develop, implement and refine a communications plan to inform stakeholders and government officials about the resources of the Indian River Lagoon, the economic and ecological value of these resources and threats to the continued viability of these resources. Priority: High.
PIE-4 Increase public and governmental involvement in activities designed to protect and restore the resources of the Indian River Lagoon. Priority: High.
PIE-5 Strategically prioritize and implement public education programs based on pollution potential, perceived likelihood for behavior change, resource availability, and opportunities that arise. Priority: High.

Wetlands
W-6 Continue projects to restore shorelines. Priority – High.

*Total of 15 High Priority and 1Medium Priority Action Plans within 6 CCMP categories
## Section A.2 IRLNEP Work Plan Projects FY 2015-2016

<table>
<thead>
<tr>
<th>Activity</th>
<th>Applicant</th>
<th>CCMP Action Plan and Priority</th>
<th>Project Title and Abstract</th>
<th>CWA320 Funding FY 2015-2016</th>
<th>Project Partner Match</th>
<th>Total Project Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Marine Resources Council</td>
<td>High (FSD-11) High (PIE-2)</td>
<td>Indian River Lagoon Program Education Coordination. A contractor will administer the Education Program, organize the annual four-day lagoon summer training workshop for IRL region teachers, and coordinate the design of the annual IRL calendar photo contest. The Coordinator also disseminates IRL information to the community at environmental educational events, brown bag lunches and public speaking events.</td>
<td>69,192</td>
<td>0</td>
<td>69,192</td>
</tr>
<tr>
<td>2</td>
<td>The Brevard Zoo</td>
<td>High (F-1) High (F-3)</td>
<td>Community Outreach, Restoration and Monitoring of Intertidal Oyster Reefs in the Indian River Lagoon. Project goal is to increase the number of live oysters (Crassostrea virginica) in the Indian River Lagoon for filtration, denitrification, biodiversity protection, and substrate stabilization. This will be accomplished in two ways. First, the Zoo will continue, and potentially complete, their scientifically-based and proven intertidal reef restoration methods in Mosquito Lagoon (Volusia County). Second, the Zoo will begin testing new methods to determine if oyster habitat can be created in areas in Brevard County where oysters are not currently present.</td>
<td>69,375</td>
<td>71,770</td>
<td>141,145</td>
</tr>
<tr>
<td>3</td>
<td>University of Central Florida</td>
<td>High (F-4) High (PIE-4)</td>
<td>Preparing Titusville for the Future: Developing a Shoreline Management Plan and Constructing a Shoreline Restoration Pilot Project. The University of Central Florida will help the City of Titusville begin development of a Shoreline Management Plan, with living shorelines as its central theme, and construct a demonstration site at a City-owned park. The Plan will be used to identify and implement environmental enhancement opportunities as the existing shoreline is developed and re-developed.</td>
<td>40,610</td>
<td>44,948</td>
<td>85,558</td>
</tr>
<tr>
<td>4</td>
<td>Brevard County Natural Resources Management Department</td>
<td>High (FSD-4) High (FSD-11)</td>
<td>Brevard County – Channel Denitrification Treatment to Reduce Nutrient Loading to the Indian River Lagoon. This water quality improvement project addresses nutrient loading by utilizing innovative groundwater and stormwater treatment technologies to intercept nutrient-laden suburban waters prior to discharge into the Indian River Lagoon. The project also includes associated education and outreach efforts to promote behavioral changes that benefit the IRL.</td>
<td>32,000</td>
<td>33,948</td>
<td>65,948</td>
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<tr>
<td>5</td>
<td>Florida Department of Environmental Protection, IRL Aquatic Preserve</td>
<td>High (W-5) High (W-6)</td>
<td>Indian River Lagoon Shoreline Restoration Project. The goal of the Shoreline Restoration Project from 1995-2014 has been to re-establish fringing mangrove habitat on public shorelines along the Indian River Lagoon, while promoting public education and awareness of mangrove habitat and its ecosystem benefits.</td>
<td>53,052</td>
<td>57,897</td>
<td>110,949</td>
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<tr>
<td>6</td>
<td>Marine Resources Council of East Florida, Inc.</td>
<td>High (FSD-11) High (PIE-5)</td>
<td>Be Floridian in the IRL: A Landscape Fertilizer Awareness Campaign. The goal of this project is to encourage the proper use of residential landscape fertilizers through a strategically designed lagoon-wide media campaign at a critical time for local government implementation. The project builds on the opportunity to leverage the work of the highly successful “Be Floridian” fertilizer education campaign created by the Tampa Bay Estuary Program in partnership with Manatee County, Sarasota County, Pinellas County, City of St. Petersburg, City of Tampa, the National Fish and Wildlife Foundation and the Sarasota Bay Estuary Program.</td>
<td>53,000</td>
<td>39,200</td>
<td>92,200</td>
</tr>
<tr>
<td>7</td>
<td>St. Lucie County Board of County Commissioners</td>
<td>High (PIE-1) High (PIE-5)</td>
<td>Lagoon Life Education Program. The objective of Lagoon Life Resource Education Program is to educate St. Lucie County youth, their families and other community members about the diversity and importance of the Indian River Lagoon and the effect of their footprint. Under this program, thousands of students, family and community members in St. Lucie will learn what they can do to preserve the fragile ecosystem of the Indian River Lagoon.</td>
<td>29,469</td>
<td>10,000</td>
<td>39,469</td>
</tr>
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<td>Activity</td>
<td>Applicant</td>
<td>CCMP Action Plan and Priority</td>
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<td>8</td>
<td>Marine Discovery Center</td>
<td>High (PIE-2) Medium (CC-3)</td>
<td>Project H2O: Promoting Healthy Habitat through Outreach. The goal of this project is to facilitate an integrated water quality consortium of governments, universities and other research organizations, and non-governmental organizations within Volusia County to collaborate on research, education, restoration and funding opportunities that will facilitate meaningful improvements in water quality and habitat of the Indian River Lagoon.</td>
<td>50,700</td>
<td>10,000</td>
<td>60,700</td>
</tr>
<tr>
<td>9</td>
<td>County of Volusia</td>
<td>High (FSD-4) High (FSD-13)</td>
<td>Wilbur by the Sea Drainage Improvements Project. The goal of this project is to provide stormwater treatment for an 18+ acre drainage basin that currently discharges untreated stormwater runoff into the Halifax River, an impaired water body. The project will reduce the discharge of the stormwater via construction of an exfiltration trench piping system and will reduce sediment and nutrients discharging into the river via a nutrient separating baffle box and a nutrient reduction media filter fabric in the exfiltration trench.</td>
<td>80,000</td>
<td>203,961</td>
<td>283,961</td>
</tr>
<tr>
<td>10</td>
<td>City of Sebastian</td>
<td>High (F-1) High (F-3)</td>
<td>Sebastian Oyster Mats. The project will utilize oyster mats to effectively filter nutrients, algae, bacteria, fine sediments and toxins from the impaired Indian River Lagoon.</td>
<td>402</td>
<td>47,526</td>
<td>47,928</td>
</tr>
<tr>
<td>11</td>
<td>Cape Canaveral Scientific, Inc.</td>
<td>High (FSD-13) High (FSD-14)</td>
<td>2015-16 Grant Writing &amp; Capacity Building to Support the IRL-CCMP. This project will provide grant-writing acquisition services to local governments and non-profit organizations tasked with implementing the CCMP.</td>
<td>60,000</td>
<td>18,750</td>
<td>78,750</td>
</tr>
<tr>
<td>12</td>
<td>Brevard County Natural Resources Management Department</td>
<td>High (FSD-10) High (PIE-1)</td>
<td>Todays Leaves and Grass Clippings; Tomorrows Indian River Lagoon Muck. This is a pilot study to try to demonstrate leaching rates for the certain organic plant matter by engaging high school students in a lab experiment using leaves and grass clippings from their homes (or supplemented as necessary).</td>
<td>11,000</td>
<td>2,000</td>
<td>13,000</td>
</tr>
<tr>
<td>13</td>
<td>Indian River State College</td>
<td>High (MON-1) High (FSD-11)</td>
<td>Novel Optical Techniques Utilizing Drones to Characterize Water Quality in the Indian River Lagoon. The goals of this project are to: develop optical technique to characterize lagoon variables in laboratory setting; optimize laboratory techniques in controlled environment to pole mounted camera in realworld conditions; (phase 2 in next Work Plan year is to prove optical technique to characterize lagoon variables with Unmanned Aerial Systems (UAS, aka drones); optimize drone techniques for automation, reliability, and repeatability; automate software stitching for data visualization and to determine exact coordinates with issues; expand drone, stitching and automation techniques to other fields).</td>
<td>45,000</td>
<td>60,000</td>
<td>105,000</td>
</tr>
<tr>
<td>14</td>
<td>Indian River Lagoon National Estuary Program</td>
<td>High (PIE-1) High (PIE-4)</td>
<td>Event &amp; Conference Sponsorship: IRL Symposium $2,500, American Assembly $2,500, IRL Envirothon $1,200</td>
<td>6,200</td>
<td>0</td>
<td>6,200</td>
</tr>
</tbody>
</table>

Totals: 600,000 600,000 1,200,000
A.3. Indian River Lagoon Staff and Their Respective Position Responsibilities

SJRWMD Division of Strategic Deliverables and Continuous Improvement
IRL Program Office – Palm Bay Service Center

IRL NEP Program Interim Director, Maurice Sterling

*Interim Duties and Responsibilities:*
- Perform day-to-day tasks to support the program during sponsorship transition to the IRL Council
- Provide coordination and facilitation to the IRL NEP Advisory Board to achieve its objective of reviewing the organizational structure of the IRL NEP
- Act as the principal spokesperson for the IRL NEP in accordance with the SJRWMD's communication policies and in coordination with the SJRWMD's Office of Communications and Intergovernmental Affairs
- Utilize the SJWRMD's email system for all electronic communication and manage voice mail on the IRL NEP phone line provided for the Interim Director on a regular and timely basis

IRL NEP Project Administrator, Frank Sakuma

*Principal Duties and Responsibilities:*
- Provides primary support to the IRL Advisory Board and the IRL Council
- Develops strategies to keep implementation activities on schedule and within budget
- Oversees and provides project management for IRL Program projects and programs
- Assists in development of Management Conference reports
- Develops program budget, tracks expenditures, responds to audit and financial inquires
- Implements Management Conference agreements and the CCMP
- Assists in the planning and conduct of Management Conference meetings
- Meets with and participates in various advisory boards and committees

SJRWMD Division of Regulatory, Engineering, and Environmental Services
Environmental Sciences - Palatka

Supervising Environmental Scientist, Charles Jacoby

*Principal Duties and Responsibilities:*
- Serves as the IRL NEP Program Scientist
- Provides technical support for the IRL Council and other IRL Program staff
- Coordinates with the Bio-toxin Task Force to investigate scientific and research priorities
- Provides presentations on IRL research and environmental related issues
- Participates in the development of projects to implement the IRL CCMP
- Provides project management for IRL NEP Program/SJRWMD research and technical projects
- Participates in the implementation of environmental assessment and monitoring programs in the IRL Basin
<table>
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<tr>
<th>Activity</th>
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<th>CCMP Action Plan and Priority</th>
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<th>Project Start Date/Completion Date</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Marine Resources Council (lead contractor); Indian River Lagoon National Estuary Program</td>
<td>High (FSD-11) High (PIE-2)</td>
<td><strong>Indian River Lagoon Program Education Coordination.</strong> A contractor will administer the Education Program, organize the annual four-day lagoon summer training workshop for IRL region teachers, and coordinate the design of the annual IRL calendar photo contest. The Coordinator also disseminates IRL information to the community at environmental educational events, brown bag lunches and public speaking events.</td>
<td>69,192</td>
<td>Delivery of public education and outreach throughout the watershed, and four-day teacher summer training workshop. quarterly and final project reports.</td>
<td>10/1/2015: 9/30/2016</td>
</tr>
<tr>
<td>2</td>
<td>The Brevard Zoo (lead contractor); University of Central Florida (technical support); Citizen Volunteers</td>
<td>High (F-1) High (F-3)</td>
<td><strong>Community Outreach, Restoration and Monitoring of Intertidal Oyster Reefs in the Indian River Lagoon.</strong> Project goal is to increase the number of live oysters (Crassostrea virginica) in the Indian River Lagoon for filtration, denitrification, biodiversity protection, and substrate stabilization. This will be accomplished in two ways. First, the Zoo will continue, and potentially complete, their scientifically-based and proven intertidal reef restoration methods in Mosquito Lagoon (Volusia County). Second, the Zoo will begin testing new methods to determine if oyster habitat can be created in areas in Brevard County where oysters are not currently present.</td>
<td>69,375</td>
<td>Quarterly and final summary report on the Community Outreach and Restoration of Intertidal Oysters in the Indian River Lagoon, with copies of volunteer sign-up sheets and project photos.</td>
<td>10/1/2015: 9/30/2016</td>
</tr>
<tr>
<td>3</td>
<td>University of Central Florida (lead contractor); St Johns River Water Management District (technical support); City of Titusville; Citizen Volunteers</td>
<td>High (F-4) High (PIE-4)</td>
<td><strong>Preparing Titusville for the Future: Developing a Shoreline Management Plan and Constructing a Shoreline Restoration Pilot Project.</strong> The University of Central Florida will help the City of Titusville begin development of a Shoreline Management Plan, with living shorelines as its central theme, and construct a demonstration site at a City-owned park. The Plan will be used to identify and implement environmental enhancement opportunities as the existing shoreline is developed and re-developed.</td>
<td>40,610</td>
<td>Shoreline vulnerability assessment; project photos and volunteer sign-up sheets from construction of a living shoreline demonstration site; copy of homeowners presentation and sign-up sheets; quarterly and final project reports.</td>
<td>10/1/2015: 9/30/2016</td>
</tr>
<tr>
<td>4</td>
<td>Brevard County Natural Resources Management Department</td>
<td>High (FSD-4) High (FSD-11)</td>
<td><strong>Brevard County – Channel Denitrification Treatment to Reduce Nutrient Loading to the Indian River Lagoon.</strong> This water quality improvement project addresses nutrient loading by utilizing innovative groundwater and stormwater treatment technologies to intercept nutrient-laden suburban waters prior to discharge into the Indian River Lagoon. The project also includes associated education and outreach efforts to promote behavioral changes that benefit the IRL.</td>
<td>32,000</td>
<td>Permitting, design, construction, and monitoring of a denitrification media retrofit to an existing drainage ditch with continuous groundwater flow; photos and copies of education and outreach material; quarterly and final project reports.</td>
<td>10/1/2015: 03/31/2017</td>
</tr>
<tr>
<td>5</td>
<td>Florida Department of Environmental Protection; IRL Aquatic Preserve</td>
<td>High (W-5) High (W-6)</td>
<td><strong>Indian River Lagoon Shoreline Restoration Project.</strong> The goal of the Shoreline Restoration Project from 1995-2014 has been to re-establish fringing mangrove habitat on public shorelines along the Indian River Lagoon, while promoting public education and awareness of mangrove habitat and its ecosystem benefits.</td>
<td>53,052</td>
<td>Supporting documentation and final project report on the IRL Shoreline Restoration Project activities for 2015-2016</td>
<td>10/1/2015: 9/30/2016</td>
</tr>
<tr>
<td>6</td>
<td>Marine Resources Council of East Florida, Inc. (lead contractor); Martin County; Volusia County</td>
<td>High (FSD-11) High (PIE-5)</td>
<td><strong>Be Floridian in the IRL: A Landscape Fertilizer Awareness Campaign.</strong> The goal of this project is to encourage the proper use of residential landscape fertilizers through a strategically designed lagoon-wide media campaign at a critical time for local government implementation. The project builds on the opportunity to leverage the work of the highly successful “Be Floridian” fertilizer education campaign created by the Tampa Bay Estuary Program in partnership with Manatee County, Sarasota County, Pinellas County, City of St. Petersburg, City of Tampa, the National Fish and Wildlife Foundation and the Sarasota Bay Estuary Program.</td>
<td>53,000</td>
<td>“Be Floridian” marketing campaign with a website, billboards, print ads, and digital ads, as well as materials for retail outlets; quarterly and final project reports.</td>
<td>10/1/2015: 9/30/2016</td>
</tr>
<tr>
<td>7</td>
<td>St. Lucie County (lead contractor); University of Florida/Institute of Food and Agricultural Sciences; St. Lucie County School Board; The Smithsonian</td>
<td>High (PIE-1) High (PIE-5)</td>
<td><strong>Lagoon Life Education Program.</strong> The objective of Lagoon Life Resource Education Program is to educate St. Lucie County youth, their families and other community members about the diversity and importance of the Indian River Lagoon and the effect of their footprint. Under this program, thousands of students, family and community members in St. Lucie will learn what they can do to preserve the fragile ecosystem of the Indian River Lagoon.</td>
<td>29,469</td>
<td>Design and implementation of education program to increase knowledge of the IRL and invasive exotic flora and fauna, and management plans for positive actions that can be taken to minimize impacts of invasive exotics in the IRL; quarterly and final project reports.</td>
<td>10/1/2015: 9/30/2016</td>
</tr>
<tr>
<td>Activity</td>
<td>Project Partners</td>
<td>CCMP Action Plan and Priority</td>
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<td>8</td>
<td>Marine Discovery Center (lead contractor); Volusia County Environmental Management; Bethune-Cookman College; Daytona State College; Stetson University; St. Johns River Water Management District; Volusia County Schools District Project Bids; Blue Spring Alliance; University of Florida/IFAS Extension; League of Women Voters</td>
<td>High (PIE-2) Medium (CC-3)</td>
<td>Project H2O: Promoting Healthy Habitat through Outreach. The goal of this project is to facilitate an integrated water quality consortium of governments, universities and other research organizations, and non-governmental organizations within Volusia County to collaborate on research, education, restoration and funding opportunities that will facilitate meaningful improvements in water quality and habitat of the Indian River Lagoon.</td>
<td>50,700</td>
<td>Framework and outreach campaign for Project H2O; creation of a centralized communications network between project partners; increased awareness of the “Be Floridian” fertilizer education campaign; identification of data gaps in ongoing research, water quality collection, restoration efforts and point-source nutrient inputs in Volusia estuarine waters; identification of post-grant funding sources; quarterly and final project reports.</td>
<td>10/1/2015: 9/30/2016</td>
</tr>
<tr>
<td>9</td>
<td>County of Volusia</td>
<td>High (FSD-4) High (FSD-13)</td>
<td>Wilbur by the Sea Drainage Improvements Project. The goal of this project is to provide stormwater treatment for an 18+ acre drainage basin that currently discharges untreated stormwater runoff into the Halifax River, an impaired water body. The project will reduce the discharge of the stormwater via construction of an exfiltration trench piping system and will reduce sediment and nutrients discharging into the river via a nutrient separating baffle box and a nutrient reduction media filter fabric in the exfiltration trench.</td>
<td>80,000</td>
<td>Engineering design, permitting, construction, and monitoring of a BMP exfiltration piping and trench on Oriole Avenue to reduce the stormwater flows to Cardinal Boulevard, and the installation of a nutrient separating baffle box on the Marcelle Avenue outfall pipe, resulting in an annual estimated TN reduction of 31 lbs and TP of 11.4 lbs.; quarterly and final project reports.</td>
<td>10/1/2015: 9/30/2016</td>
</tr>
<tr>
<td>10</td>
<td>City of Sebastian (lead contractor); Sebastian Natural Resource Board; Citizen Volunteers</td>
<td>High (F-1) High (F-3)</td>
<td>Sebastian Oyster Mats. The project will utilize oyster mats to effectively filter nutrients, algae, bacteria, fine sediments and toxins from the impaired Indian River Lagoon.</td>
<td>402</td>
<td>Quarterly and final summary report on the construction and installation of oyster shell mats in the Indian River Lagoon, with copies of volunteer sign-up sheets, project photos, and detail of education and outreach accomplishments.</td>
<td>10/1/2015: 9/30/2016</td>
</tr>
<tr>
<td>11</td>
<td>Cape Canaveral Scientific, Inc.</td>
<td>High (FSD-13) High (FSD-14)</td>
<td>2015-16 Grant Writing &amp; Capacity Building to Support the IRL-CCMP. This project will provide grant-writing acquisition services to local governments and non-profit organizations tasked with implementing the CCMP.</td>
<td>60,000</td>
<td>Delivery of six competitive grant applications on behalf of local governments to help implement the IRL CCMP; quarterly and final project reports.</td>
<td>10/1/2015: 9/30/2016</td>
</tr>
<tr>
<td>12</td>
<td>Brevard County Natural Resources Management Department (lead contractor); Marine Resources Council; Brevard County High School (TBD); Student Volunteers</td>
<td>High (FSD-10) High (PIE-1)</td>
<td>Todays Leaves and Grass Clippings; Tomorrows Indian River Lagoon Muck. This is a pilot study to try to demonstrate leaching rates for the certain organic plant matter by engaging high school students in a lab experiment using leaves and grass clippings from their homes (or supplemented as necessary).</td>
<td>11,000</td>
<td>Simultaneous demonstration projects at a Brevard County field station on Merritt Island and replicated by students at a participating high school. Development of a comprehensive lesson plan for high school level, with an evaluation regime to determine how much the students retained after the project; quarterly and final project reports.</td>
<td>10/1/2015: 1/15/2017</td>
</tr>
<tr>
<td>Activity</td>
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<tr>
<td>13</td>
<td>Indian River State College (lead contractor); Florida Power and Light; Native VFX</td>
<td>High (MON-1) High (FSD-11)</td>
<td>Novel Optical Techniques Utilizing Drones to Characterize Water Quality in the Indian River Lagoon. The goals of this project are to: develop optical technique to characterize lagoon variables in laboratory setting; optimize laboratory techniques in controlled environment to pole mounted camera in realworld conditions; (phase 2 in next Work Plan year is to prove optical technique to characterize lagoon variables with Unmanned Aerial Systems (UAS, aka drones); optimize drone techniques for automation, reliability, and repeatability; automate software stitching for data visualization and to determine exact coordinates with issues; expand drone, stitching and automation techniques to other fields).</td>
<td>45,000</td>
<td>Development, optimization, and proof of optical techniques in a laboratory environment to measure nitrate, phosphate, temperature, turbidity, and algae blooms; transfer, optimization, and proof of optical techniques developed in lab in a real world environment with pole-mounted camera; quarterly reports.</td>
<td>10/1/2015: 9/30/2016</td>
</tr>
<tr>
<td>14</td>
<td>Indian River Lagoon National Estuary Program</td>
<td>High (PIE-1) High (PIE-4)</td>
<td>Event &amp; Conference Sponsorship: IRL Symposium $2,500, American Assembly $2,500, IRL Envirothon $1,200</td>
<td>6,200</td>
<td>Sponsorship of the IRL Symposium; American Assembly; and the IRL Envirothon</td>
<td>10/1/2015: 9/30/2016</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>600,000</strong></td>
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Section B.1 Indian River Lagoon National Estuary Program 2015-2016

Outputs and Outcomes

Outputs:

- Continued Program administration providing NEP Board and management conference support, CCMP implementation oversight and budgeting/project/contract management activities and reports

- Delivery of public education and outreach presentations throughout the watershed, implementation of the 2015-16 portion of the NEP Communications Plan, teacher summer training workshop, production of the annual IRL Calendar

- Quarterly and final summary report on the Community Outreach and Restoration of Intertidal Oyster Reef in Indian River Lagoon with copies of volunteer sign-up sheets and project photos

- Shoreline vulnerability assessment; project photos and volunteer sign-up sheets from construction of a living shoreline demonstration site; copy of homeowners presentation and sign-up sheets; quarterly and final project reports

- Permitting, design, construction, and monitoring of a denitrification media retrofit to an existing drainage ditch with continuous groundwater flow; photos and copies of education and outreach material; quarterly and final project reports

- Project Report on the FDEP Aquatic Preserves IRL Shoreline Restoration Project activities for 2015-16

- “Be Floridian” marketing campaign with a website, billboards, print ads, and digital ads, as well as materials for retail outlets; quarterly and final project reports

- Design and implementation of education program to increase knowledge of the IRL and invasive exotic flora and fauna, and management plans for positive actions that can be taken to minimize impacts of invasive exotics in the IRL; quarterly and final project reports

- Framework and outreach campaign for Project H2O; creation of a centralized communications network between project partners; increased awareness of the “Be Floridian” fertilizer education campaign; identification of data gaps in ongoing research, water quality collection, restoration efforts and point-source nutrient inputs in Volusia estuarine waters; identification of post-grant funding sources; quarterly and final project reports

- Engineering design, permitting, construction, and monitoring of a BMP exfiltration piping and trench on Oriole Avenue; installation of a nutrient separating baffle box on the Marcelle Avenue outfall pipe; estimated TN reduction of 31 lbs and TP of 11.4 lbs.; quarterly and final project reports

- Quarterly and final summary report on the construction and installation of oyster shell mats in the Indian River Lagoon near the city of Sebastian, with copies of volunteer sign-up sheets, project photos, and detail of education and outreach accomplishments
• Delivery of five (6) competitive grant applications on behalf of local governments to help implement the IRL CCMP

• Simultaneous demonstration projects at a Brevard County field station on Merritt Island and replicated by students at a participating high school. Development of a comprehensive lesson plan for high school level, with an evaluation regime to determine how much the students retained after the project; quarterly and final project reports

• Development, testing and deployment of a drone based camera sensor capable of scanning and recording hundreds of miles water pollutant levels of the lagoon at one time; quarterly and final reports

**Outcomes:**

• Clean Water Act implementation

• EPA Strategic Plan implementation

• Support of EPA Non-Point Source Program

• Improved water quality and shoreline habitats

• Restored oyster beds

• Increased use of native plants

• Increased Program visibility

• Increased wetland acreage restored and or protected

• Increased public awareness and stewardship

• Continued watershed-wide coordination and networking

• Increased knowledge of living resources
Section B.2 Proposed New and Ongoing Project Reporting Requirements

Activity 1

CCMP/Work Plan Goal:
FSD-11: Priority-High. Educate residents and property owners about the impacts of freshwater and storm water discharges on the Indian River Lagoon and what they can do to reduce these impacts.
PIE-2: Priority-High. Develop, implement and refine a communications plan to inform stakeholders and government officials about the resources of the Indian River Lagoon, the economic and ecological value of these resources and threats to the continued viability of these resources.

Project/Activity Name:
IRLNEP Outreach and Education Coordination and Communications Plan Implementation
Lead Contractor: Marine Resources Council, Inc.

Project/Activity Purpose and Description: (indicate as proposed or ongoing)
This project is ongoing. Marine Resources Council (MRC) will administer the Education Program for the Indian River Lagoon Program. Additionally, MRC will coordinate the activities of the IRLNEP Citizens Action Committee and the Education Committee, organize lagoon summer training teacher workshops, and coordinate the design of the annual IRL calendar photo contest. MRC also produces and disseminates IRL information to the community at environmental educational events, brown bag lunches and public speaking events.

Budget: $69,192 NEP funding.

Outcomes: (report anticipated and/or completed accomplishments)

Short-term: Attend and provide IRLNEP materials to the public at speaking events and festivals. Discuss IRL strengths and challenges with the public at those events. Implement the 2015-2016 portion of the adopted IRL NEP Communications Plan.

Intermediate: Increased awareness of the state of the IRL and promote changes in lifestyle that will benefit the IRL.

Changes (+/-) in Pressure Targets: Positive as teachers, students, citizens and community leaders are informed about IRL strengths and challenges and because of this heightened awareness, become better stewards of the IRL.

Long-term: Public awareness of the importance of the IRL habitat restoration and water quality improvement programs; anthropogenic impacts to the IRL and changes in behavior that will curtail pointless personal pollution.

CWA implementation information:
This project addresses a core objective of the Clean Water Act to protect coastal waters through the National Estuary Program.
Activity 2

CCMP/Work Plan Goal:
F-1: Priority - High. Conserve, protect, restore and manage the finfish and shellfish resources in the Indian River Lagoon region.
F-3: Priority - High. Support and expand research initiatives and coordinated finfish and shellfish management strategies.

Project/Activity Name:
Community Outreach, Restoration and Monitoring of Intertidal Oyster Reefs in the Indian River Lagoon

Lead Contractor: The Brevard Zoo

Project/Activity Purpose and Description: (indicate as proposed or ongoing)
This project is ongoing. The project goal is to increase the number of live oysters (Crassostrea viriginica) in the Indian River Lagoon for filtration, denitrification, biodiversity protection, and substrate stabilization by: 1) Continue the scientifically-based and proven intertidal reef restoration methods in Mosquito Lagoon in Volusia County, and 2) Begin testing new methods to determine if oyster habitat can be created in areas of the IRL in Brevard County where oysters are not currently present. To meet the project goals, the Brevard Zoo will continue to organize volunteers to produce a minimum of 1,000 restoration mats/shell bags and deploy them on 3 additional reefs. Project funding will also support the contractual efforts of UCF to conduct the following activities: conduct three vertical reef profiles for each dead margin to be leveled; collect any live plant biomass on these dead margins; determine dry weights of all biomass collected; and continue post-restoration monitoring of the existing restored reefs that includes collecting data on recruitment, shell lengths, linkages between oysters (clusters), native and non-native species, reef thickness, seagrass recruitment and oyster recruitment beyond the restoration footprint.

Budget: $69,375 NEP Funding, $71,770 in-kind match from The Brevard Zoo, the University of Central Florida, and citizen volunteers.

Outcomes: (report anticipated and/or completed accomplishments)

Short-term: Production and deployment of 1,000 oyster mats/shell bags in the Indian River Lagoon restoring 3 additional intertidal reefs.

Intermediate: Quarterly and final summary report on the Community Outreach and Restoration of Intertidal Oyster Reef in the Indian River Lagoon with copies of volunteer sign-up sheets and project photos.

Changes (+/-) in Pressure Targets: Positive as the number of oyster reefs in the Indian River Lagoon increases and the outreach component of this project allows citizen volunteers to be directly involved in a marine restoration project.

Long-term: Historically viewed as a commodity to harvest, sell and eat, oysters have been gaining value for the economically important “ecosystem services” they provide including water filtration, shoreline stabilization, and shelter and food for many commercially and recreationally important species in the IRL.

CWA implementation information
This project addresses core objectives of the Clean Water Act to protect wetlands, and protect coastal waters through the National Estuary Program.
Activity 3

CCMP/Work Plan Goal:
F-4: Priority-High. Identify, inventory and assess finfish and shellfish habitats within the Indian River Lagoon and implement appropriate management and restoration strategies.
PIE-4: Priority- High. Increase public and governmental involvement in activities designed to protect and restore the resources of the IRL.

Project/Activity Name:
Preparing Titusville for the Future: Developing a Shoreline Management Plan and Constructing a Shoreline Restoration Pilot Project
Lead Contractor: University of Central Florida (UCF)

Project/Activity Purpose and Description: (indicate as proposed or ongoing)
This project is proposed. The goals of this project are to: provide best management practices for protecting and restoring the existing estuarine habitat along Titusville’s IRL shoreline; create priorities and recommendations for mitigation related to commercial or residential development along the shoreline; provide a roadmap to develop a stable, productive and sustainable shoreline; and protect water quality. UCF will conduct a shoreline vulnerability assessment along the 14 miles of shoreline owned by the City, to include field data collection, analysis of historic shoreline information, and wind and wave modeling. Community residents will be engaged in construction of a living shoreline demonstration site at a city-owned park on Main Street in downtown Titusville using oyster shell bags, smooth cordgrass, and mangroves. UCF will develop a presentation for two homeowner workshops to educate residents about benefits of living shorelines, sources for materials, permitting information, and relevance to adaptations to sea level rise.

Budget: $40,610 NEP Funding, $44,948 in-kind match from UCF, City of Titusville, St. Johns River Water Management District, and citizen volunteers.

Outcomes: (report anticipated and/or completed accomplishments)

Short-term: Reduce erosion and improve shoreline habitat by constructing a living shoreline demonstration site to stabilize the shoreline sediments and buffer wave actions using native vegetation and oyster shell bags. Community engagement, education and outreach in a living shoreline restoration project. City of Titusville Shoreline Management Plan.

Intermediate: Increase intertidal habitat for fisheries and other marine organisms and improve erosion protection. Providing/protecting habitat for federally listed species, educating waterfront community residents of ways they may protect their private lagoon shorelines using similar living shoreline techniques.

Changes (+/-) in Pressure Targets: Positive, as erosion is reduced and volunteers participate in the restoration project learning about living shoreline benefits and techniques.

Long-term: Protected Indian River Lagoon shoreline with increased native habitats within a public park setting for on-going educational opportunities, and a shoreline management plan for a city along 14 miles of the IRL.

CWA implementation information:
This project addresses core objectives of the Clean Water Act to protect wetlands, and protect coastal waters through the National Estuary Program.
Activity 4

CCMP/Work Plan Goal:
FSD-4: Develop and implement best management practices (BMPs) for the management of stormwater, agricultural and fresh water discharges.
FSD-11; Priority-High. Educate residents and property owners about the impacts of freshwater and storm water discharges on the Indian River Lagoon and what they can do to reduce these impacts.

Project/Activity Name:
Brevard County – Channel Denitrification Treatment to Reduce Nutrient Loading to the Indian River Lagoon
Lead Contractor: Brevard County Natural Resources Management Department

Project/Activity Purpose and Description: (indicate as proposed or ongoing)
This project is proposed. This water quality improvement project addresses nutrient loading by utilizing innovative groundwater and stormwater treatment technologies to intercept nutrient-laden suburban waters prior to discharge into the Indian River Lagoon. The project also includes associated education and outreach efforts to promote behavioral changes that benefit the IRL.

Budget: $32,000 NEP Funding, $33,948 in-kind match from Brevard County.

Outcomes: (report anticipated and/or completed accomplishments)

Short-term: Permitting, design, construction, and monitoring of a denitrification media retrofit to an existing drainage ditch with continuous groundwater flow; photos and copies of education and outreach material; quarterly and final project reports.

Intermediate: Evaluation of effectiveness of stormwater treatment technologies to absorb nutrients passing through an existing drainage ditch with continuous groundwater flow.

Changes (+/-) in Pressure Targets: Positive, as pollutant loadings to the IRL will be reduced.

Long-term: Enhancement of existing and ongoing programs within the North IRL BMAP and throughout the watershed.

CWA implementation information:
This project addresses core objectives of the Clean Water Act to address diffuse, nonpoint sources of pollution, and protect coastal waters through the National Estuary Program.
Activity 5

CCMP/Work Plan Goal:

Project/Activity Name:
Indian River Lagoon Shoreline Restoration Project.
Lead Contractor: Florida Department of Environmental Protection – IRL Aquatic Preserves

Project/Activity Purpose and Description: (indicate as proposed or ongoing)
This project is ongoing. The goal of this project is to continue to stabilize publicly owned shorelines impacted by wave energy to limit erosion, sedimentation and enhance littoral habitat, while facilitating environmental awareness, stewardship and public participation in restoration activities.

Budget: $53,052 NEP Funding, $57,897 in-kind match and volunteer services from FDEP IRL Aquatic Preserves.

Outcomes: (report anticipated and/or completed accomplishments)

Short-term: Planting of native species along two identified mangrove ecosystem restoration sites of 200m² of shoreline, removal of invasive exotics at the sites. Provide an activity for volunteers to participate in lagoon restoration enhancing stewardship and awareness.

Intermediate: Expand mangrove and saltmarsh shoreline habitat ecological benefits, reducing suspended solids and erosion and contributing to shoreline stabilization.

Changes (+/-) in Pressure Targets: Positive as the shoreline native vegetation becomes established and provides enhanced estuarine habitat and improvements to adjacent surface water quality. Development of volunteers to become IRL stewards.

Long-term: Restoration of mangrove shoreline forests, enhanced public participation in restoration activities, and enhanced habitat and water quality.

CWA implementation information:
This project addresses core objectives of the Clean Water Act to protect wetlands, and protect coastal waters through the National Estuary Program.
Activity 6

**CCMP/Work Plan Goal:**
FSD-11: Priority-High. Educate residents and property owners about the impacts of freshwater and storm water discharges on the Indian River Lagoon and what they can do to reduce these impacts.

PIE-5: Priority-High. Strategically prioritize and implement public education programs based on pollution potential, perceived likelihood for behavior change, resource availability, and opportunities that arise.

**Project/Activity Name:**
Be Floridian in the IRL: A Landscape Fertilizer Awareness Campaign

**Lead Contractor:** Marine Resources Council of East Florida, Inc.

**Project/Activity Purpose and Description:** (indicate as proposed or ongoing)
This project is proposed. The goal of this project is to encourage the proper use of residential landscape fertilizers through a strategically designed lagoon-wide media campaign at a critical time for local government implementation. The project builds on the opportunity to leverage the work of the highly successful “Be Floridian” fertilizer education campaign created by the Tampa Bay Estuary Program in partnership with Manatee County, Sarasota County, Pinellas County, City of St. Petersburg, City of Tampa, the National Fish and Wildlife Foundation and the Sarasota Bay Estuary Program.

**Budget:** $53,000 NEP Funding, $39,200 in match funding from Marine Resources Council, Inc., Martin County, and Volusia County.

**Outcomes:** (report anticipated and/or completed accomplishments)

**Short-term:** “Be Floridian” marketing campaign with a website, billboards, print ads, and digital ads, as well as materials for retail outlets; quarterly and final project reports.

**Intermediate:** Increased public awareness of local fertilizer restriction ordinances and link to water quality.

**Changes (+/-) in Pressure Targets:** Projected change is positive. As nonpoint source pollution from residential landscapes will be reduced.

**Long-term:** Reduced nutrient loading from residential landscapes and resulting improvements in IRL and watershed water quality.

**CWA implementation information:**
This project addresses core objectives of the Clean Water Act to develop plans to restore polluted waters, address diffuse, nonpoint sources of pollution, and protect coastal waters through the National Estuary Program.
Activity 7

CCMP/Work Plan Goal:
PIE-1: Priority - High. Implement and expand public involvement and education projects or programs.
PIE-5: Priority – High. Prioritize and implement behavior changes oriented education programs to reduce pointless personal pollution.

Project/Activity Name:
Lagoon Life Education Program
Lead Contractor: St. Lucie County

Project/Activity Purpose and Description: (indicate as proposed or ongoing)
This project is proposed. The objective of this project is to educate St. Lucie County youth, their families and other community members about the diversity and importance of the Indian River Lagoon and the effect of their footprint. Under this program, thousands of students, family and community members in St. Lucie will learn what they can do to preserve the fragile ecosystem of the Indian River Lagoon. A primary objective of the program is to increase critical thinking skills. Attention will be focused on exotic invasive species encompassing both flora and fauna. Participants will gain the ability to share what they can do to have a less negative, or even a positive, impact on the Lagoon.

Budget: $29,469 NEP Funding, $10,000 in-kind match from St. Lucie County.

Outcomes: (report anticipated and/or completed accomplishments)

Short-term: Design and implementation of education program to increase knowledge of the IRL and invasive exotic flora and fauna, and management plans for positive actions that can be taken to minimize impacts of invasive exotics in the IRL; quarterly and final project reports.

Intermediate: The Lagoon Life Education Program will develop a high quality curriculum that engages students and motivates them to learn about the IRL ecosystem and adjacent environmental communities.

Changes (+/-) in Pressure Targets: Positive, as students become the next generation of IRL stewards.

Long-term: Students are prepared for their role as future citizens and environmental stewards, and awareness and understanding is created that everyone has a role to play in protecting our environment.

CWA implementation information:
This project addresses a core objective of the Clean Water Act to protect coastal waters through the National Estuary Program.
Activity 8

CCMP/Work Plan Goal:
PIE-2: Priority-High. Develop, implement and refine a communications plan to inform stakeholders and government officials about the resources of the Indian River Lagoon, the economic and ecological value of these resources and threats to the continued viability of these resources.
CC-3: Priority-Medium. Provide information to local governments and residents of the Indian River Lagoon region about impacts of climate change and actions they can take to reduce these impacts.

Project/Activity Name:
Project H2O: Promoting Healthy Habitat through Outreach
Lead Contractor: Marine Discovery Center

Project/Activity Purpose and Description: (indicate as proposed or ongoing)
This project is proposed. The goal of this project is to facilitate an integrated water quality consortium of governments, universities and other research organizations, and non-governmental organizations within Volusia County to collaborate on research, education, restoration and funding opportunities that will facilitate meaningful improvements in water quality and habitat of the Indian River Lagoon.

Budget: $50,700 NEP Funding, $10,000 in-kind match from Volusia County Environmental Management, Marine Discovery Center, Bethune-Cookman College, Daytona State College, Stetson University, St Johns River Water Management District, Volusia County Schools District Project Ibis, Blue Spring Alliance, University of Florida/IFAS Extension, and the League of Women Voters.

Outcomes: (report anticipated and/or completed accomplishments)

Short-term: Framework and outreach campaign for Project H2O; creation of a centralized communications network between project partners; increased awareness of the "Be Floridian" fertilizer education campaign; identification of data gaps in ongoing research, water quality collection, restoration efforts and point-source nutrient inputs in Volusia estuarine waters; identification of post-grant funding sources; quarterly and final project reports.

Intermediate: Increased awareness of key issues and funding sources related to IRL protection and restoration.

Changes (+/-) in Pressure Targets: Positive, as the project supports enhanced education and outreach to involve more people and businesses in the solutions to solving the lagoon’s challenges.

Long-term: A collaborative stakeholder group to enhance existing projects, maximize available resources, increase funding opportunities through joint grant proposals, and improve communications and help to integrate lagoon issues into actions.

CWA implementation information:
This project addresses a core objective of the Clean Water Act to protect coastal waters through the National Estuary Program.
Activity 9

CCMP/Work Plan Goal:
FSD-4: Develop and implement best management practices (BMPs) for the management of stormwater, agricultural and fresh water discharges.

Project/Activity Name:
Wilbur by the Sea Drainage Improvements Project
Lead Contractor: Volusia County

Project/Activity Purpose and Description: (indicate as proposed or ongoing)
This project is proposed. The goal of this project is to provide stormwater treatment for an 18+ acre drainage basin that currently discharges untreated stormwater runoff into the Halifax River, an impaired water body. The project will reduce the discharge of the stormwater via construction of an exfiltration trench piping system and will reduce sediment and nutrients discharging into the river via a nutrient separating baffle box and a nutrient reduction media filter fabric in the exfiltration trench.

Budget: $80,000 NEP Funding, $203,961 in-kind match from Volusia County.

Outcomes: (report anticipated and/or completed accomplishments)

Short-term: Engineering design, permitting, construction, and monitoring of a BMP exfiltration piping and trench on Oriole Avenue to reduce the stormwater flows to Cardinal Boulevard, and the installation of a nutrient separating baffle box on the Marcelle Avenue outfall pipe; quarterly and final project reports.

Intermediate: An annual estimated TN reduction of 31 lbs and TP of 11.4 lbs from discharge to the IRL.

Changes (+/-) in Pressure Targets: Positive, as the baffle box and streetscape improvements are maintained and cleaned less sediments and trash and organic matter (leaves / grass clippings) will enter the IRL.

Long-term: Improves the quality of stormwater discharged to the lagoon, educates residents in the area about stormwater impacts and ways they can help reduce pollution loadings.

CWA implementation information:
This project addresses core objectives of the Clean Water Act to address diffuse, nonpoint sources of pollution, and protect coastal waters through the National Estuary Program.
Activity 10

**CCMP/Work Plan Goal:**

*F-1: Priority - High. Conserve, protect, restore and manage the finfish and shellfish resources in the Indian River Lagoon region.*

*F-3: Priority - High. Support and expand research initiatives and coordinated finfish and shellfish management strategies.*

**Project/Activity Name:**

*Sebastian Oyster Mats*

*Lead Contractor: City of Sebastian*

**Project/Activity Purpose and Description:** (indicate as proposed or ongoing)

This project is proposed. The project will utilize oyster mats to effectively filter nutrients, algae, bacteria, fine sediments and toxins from the impaired Indian River Lagoon.

**Budget:** $402 NEP Funding, $23,598 IRL License Plate match funding, $23,928 in-kind from City of Sebastian and volunteers.

**Outcomes:** (report anticipated and/or completed accomplishments)

*Short-term: Production and deployment of oyster mats in the Indian River Lagoon along the intertidal zone near the City of Sebastian.*

*Intermediate: Quarterly and final summary report on the construction and installation of oyster shell mats in the Indian River Lagoon, with copies of volunteer sign-up sheets, project photos, and detail of education and outreach accomplishments.*

*Changes (+/-) in Pressure Targets: Positive as the number of oyster reefs in the Indian River Lagoon increases and the outreach component of this project allows citizen volunteers to be directly involved in a marine restoration project.*

*Long-term: Improved water quality from water filtration, shoreline stabilization, and shelter and food for many commercially and recreationally important species in the IRL.*

**CWA implementation information:**

This project addresses core objectives of the Clean Water Act to protect wetlands, and protect coastal waters through the National Estuary Program.
Activity 11

CCMP/Work Plan Goal:
FSD-13; Priority- High. Upgrade existing stormwater systems.
FSD-14; Priority- High. Develop and implement appropriate mechanisms to fund and undertake the operation, maintenance and improvement of urban and agricultural stormwater management systems to reduce pollutant loadings.

Project/Activity Name:
2015-16 Grant Writing & Capacity Building to Support the IRL CCMP.
Lead Contractor: Cape Canaveral Scientific Inc.

Project/Activity Purpose and Description: (indicate as proposed or ongoing)
This project is ongoing. The project assists local governments in meeting the challenges of financing CCMP implementation projects. Most local governments in the IRL watershed have little if any staff support including engineering services to dedicate to preparation of grant applications for stormwater projects and environmental restoration. As this project has gained acceptance and success stories circulated, more local governments have agreed to utilize the services of the grant writer team.

Budget: $60,000 NEP Funding, $18,750 in match funding from CCS.

Outcomes: (report anticipated and/or completed accomplishments)

Short-term: Develop, generate, submit and support six grant applications.

Intermediate: Since the inception of this project, the number of participating partners has steadily increased.

Changes (+/-) in Pressure Targets: Projected change is negative. As many of these grants require a local match, state mandated property tax reductions will impact implementation of CCMP Action Plans by local governments.

Long-term: These projects have a direct benefit to the IRL either through land acquisition or stormwater improvements designed to reduce nonpoint source pollution and untreated stormwater discharges to the IRL.

CWA implementation information:
This project addresses core objectives of the Clean Water Act to address diffuse, nonpoint sources of pollution, protect wetlands, and protect coastal waters through the National Estuary Program.
Activity 12

CCMP/Work Plan Goal:
FSD-10: Priority–High. Encourage the proper use of fertilizers, herbicides, pesticides and reuse water.
PIE-1: Priority–High. Implement and expand Public Information and Education Projects.

Project/Activity Name:
Today’s Leaves and Grass Clippings; Tomorrows Indian River Lagoon Muck
Lead Contractor: Brevard County Natural Resources Management Department

Project/Activity Purpose and Description: (indicate as proposed or ongoing)
This project is proposed. This is a pilot study to try to demonstrate leaching rates for the certain organic plant matter by engaging high school students in a lab experiment using leaves and grass clippings from their homes (or supplemented as necessary).

Budget: $11,000 NEP Funding, $2,000 in-kind match funding from Brevard County Natural Resources Management Department and volunteers.

Outcomes: (report anticipated and/or completed accomplishments)

Short-term: Simultaneous demonstration projects at a Brevard County field station on Merritt Island and replicated by students at a participating high school. Development of a comprehensive lesson plan for high school level, with an evaluation regime to determine how much the students retained after the project; quarterly and final project reports.

Intermediate: Students will be more equipped to become good community stewards and make behavioral changes that benefit the IRL.

Changes (+/-) in Pressure Targets: Positive as students are informed about pollutants to the IRL.

Long-term: Students, parents, and community members will gain an understanding of much needed changes and lifestyle choices to participate in IRL restoration and rehabilitation.

CWA implementation information:
This project addresses core objectives of the Clean Water Act to address diffuse, nonpoint sources of pollution, and protect coastal waters through the National Estuary Program.
Activity 13

**CCMP/Work Plan Goal:**

MON-1: Priority - High. Continue projects related to monitoring the resources of the Indian River Lagoon and address gaps in data as needed.

FSD-11: Priority - High. Educate residents and property owners about the impacts of freshwater and storm water discharges on the Indian River Lagoon and what they can do to reduce these impacts.

**Project/Activity Name:**
Novel Optical Techniques Utilizing Drones to Characterize Water Quality in the Indian River Lagoon

**Lead Contractor:** Indian River State College

**Project/Activity Purpose and Description:** (indicate as proposed or ongoing)

This project is proposed. The goals of this project are to: develop optical technique to characterize lagoon variables in laboratory setting; optimize laboratory techniques in controlled environment to pole mounted camera in real world conditions; (phase 2 in next Work Plan year is to prove optical technique to characterize lagoon variables with Unmanned Aerial Systems (UAS, aka drones); optimize drone techniques for automation, reliability, and repeatability; automate software stitching for data visualization and to determine exact coordinates with issues; expand drone, stitching and automation techniques to other fields).

**Budget:** $45,000 NEP Funding, $60,000 in match funding from Indian River State College.

**Outcomes:** (report anticipated and/or completed accomplishments)

**Short-term:** Development, optimization, and proof of optical techniques in a laboratory environment to measure nitrate, phosphate, temperature, turbidity, and algae blooms; transfer, optimization, and proof of optical techniques developed in lab in a real world environment with pole-mounted camera; quarterly reports.

**Intermediate:** The data will reveal the viability of phase one and support phase two deliverables of transfer, optimization, and proof of optical techniques developed in lab in a real world environment on a drone; reproducible drone data; target miles of lagoon recorded; data taken and related to three key events; automation of stitching, data analysis, and data visualization; dissemination of technique to three or more publications and/or presentations; adoption of techniques by two or more entities.

**Changes (+/-) in Pressure Targets:** Positive as this monitoring will assist in providing a sound scientific basis for the assessment and implementation of management strategies and BMPs designed to reduce pollutant loadings to the IRL.

**Long-term:** Improved method of creating data sets in support of evaluation of the condition of the IRL resources, and strategies implemented to manage and restore these resources.

**CWA implementation information:**

This project addresses a core objective of the Clean Water Act to protect coastal waters through the National Estuary Program.
Activity 14

CCMP/Work Plan Goal:
PIE-1 Priority-High. Implement and expand public involvement and education projects or programs. PIE-4 Priority-High. Increase public and government involvement in activities designed to protect and restore the resources of the Indian River Lagoon.

Project/Activity Name:
Event and Conference Sponsorships
Lead Contractor: Indian River Lagoon National Estuary Program

Project/Activity Purpose and Description: (indicate as proposed or ongoing)
This activity is ongoing. These funds will provide sponsorship support for several on-going conferences and events in the IRL that provide education to residents, allow their participation in the development of lagoon restoration and protection strategies, and supports environmental education for the lagoon’s high school and junior high students. Funding of $2,500 to support the annual IRL Symposium at Harbor Branch, $2,500 to support the American Assembly with the Marine Resources Council, and $1,200 to support the IRL Envirothon Environmental Education Competition for lagoon students.

Budget: $6,200 NEP Funds.

Outcomes: (report anticipated and/or completed accomplishments)

Short-term: Supports lagoon symposium and events for area residents and students.

Intermediate: Improves the knowledge and education of residents and students about the ecological and economic importance of the IRL and ways they can contribute towards the estuaries protection and restoration.

Changes (+/-) in Pressure Targets: Positive, as more residents participate in the Lagoon Symposium and American Assembly and learn about these events through media stories and students participate and compete in the Envirothon.

Long-term: Creates knowledgeable lagoon stakeholders and future stewards for lagoon protection.

CWA implementation information:
This project addresses a core objective of the Clean Water Act to protect coastal waters through the National Estuary Program.
Section C. Completed Major Projects/ Activities

Previous Years Reporting

C.1 Summary of IRLNEP and Management Conference Accomplishments for 2014-2015

The IRLNEP had another successful year in FY 2014-2015 implementing the IRL CCMP. Staff administered the Program, including 10 high priority CCMP implementation projects (please see Section C.2 of this Work Plan) which ranged from support of the IRLNEP Education and Outreach contractor to restoration of native habitat along estuarine waters. The IRLNEP also funded a number of other projects utilizing revenue from the sales of the Indian River Lagoon Specialty License Plate. These projects included stormwater improvement projects, the restoration of oyster habitat in Mosquito Lagoon, shoreline restoration and stabilization, and community education and outreach.

The IRLNEP Management Conference made up of the Indian River Lagoon Advisory Board, the Citizen’s Action Committee (CAC), and the Technical Advisory Committee (TAC) continues to lead the program through active community directed guidance and oversight.

Below and on the following pages are projects that have been initiated and/or completed by members of the IRLNEP Management Conference in FY 2014-2015.

The Indian River Lagoon License Plate Program was established to support habitat restoration, water quality improvement, and associated education projects. The South Florida Water Management District is responsible for administering Indian River Lagoon License Plate funds for projects in St. Lucie, Martin and Palm Beach counties. The IRLNEP is responsible for administering IRL License Plate funds for projects in Brevard, Volusia, and Indian River counties.

Indian River Lagoon License Plate projects completed FY2014 in Volusia, Brevard, and Indian River counties include:

- The Brevard Zoo’s Community Outreach, Restoration and Monitoring of Intertidal Oyster Reefs in Mosquito Lagoon increased the number of live oysters (Crassostrea virginica) in the Indian River Lagoon for filtration, denitrification, biodiversity protection, and substrate stabilization by continuing, and almost completing, the scientifically based and proven intertidal reef restoration ongoing in northern Mosquito Lagoon (Volusia County). In addition, the Zoo began testing new methods to determine if oyster habitat can be created in areas in Brevard County where oysters are not currently present.

- Florida Department of Environmental Protection IRL Aquatic Preserve’s Indian River Lagoon Shoreline Restoration Project. The goal of the Shoreline Restoration Project is to re-establish fringing mangrove habitat on public shorelines along the Indian River Lagoon, while promoting public education and awareness of mangrove habitat and its ecosystem benefits.

- Indian River Shores Seminole Lane Stormwater Baffle Box. The goal of this project was to substantially improve the quality of stormwater currently being released to the Indian River Lagoon from the Town's stormwater drainage system at Indian Lane through the installation of a Generation II Nutrient Separating Baffle Box.
The Florida Department of Agricultural and Consumer Services (FDACS) develops and adopts Best Management Practices (BMPs) addressing water quality and water conservation applicable to commercial agricultural operations. FDACS has adopted BMP programs for citrus, sod, vegetable/row crops, nurseries, cow/calf, equine, and specialty fruit and nut operations. Florida law provides for farmers to reduce their impacts to water quality through the implementation of BMPs adopted by FDACS. Agricultural BMPs are practical, cost-effective actions that agricultural producers can take to reduce the amount of pesticides, fertilizers, animal waste, and other pollutants entering our water resources. Implementing BMPs benefits both the farmer and the environment and demonstrates agriculture’s commitment to water resource protection.

Approximately 352,517 acres of agricultural land within Brevard, Indian River, Martin, St. Lucie, and Volusia counties are enrolled in FDACS BMP programs as of December 31, 2014. The table below provides a breakout of enrolled acres by county and commodity. In 2014, FDACS adopted the statewide nursery manual that includes BMPs for container-grown, field-grown, and cut foliage production methods. This manual replaces the previous container nursery manual, although growers enrolled in the container nursery manual are grandfathered in if they implement several specific practices included in the new statewide manual. Fern growers previously enrolled in the Leatherleaf Fern BMP, which was not verified by FDEP, are eligible to enroll in the statewide manual.

<table>
<thead>
<tr>
<th>County</th>
<th>Citrus</th>
<th>Cow/Calf</th>
<th>Fruit &amp; Nut</th>
<th>Equine</th>
<th>Nursery</th>
<th>Row Crops</th>
<th>Sod</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brevard</td>
<td>2,798.5</td>
<td>66,011.4</td>
<td>-</td>
<td>-</td>
<td>20.7</td>
<td>84.5</td>
<td>590.0</td>
<td>69,505.1</td>
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<tr>
<td>Indian River</td>
<td>39,432.4</td>
<td>11,775.1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>160.9</td>
<td>62.7</td>
<td>51,431.1</td>
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<tr>
<td>Martin</td>
<td>17,165.1</td>
<td>61,945.3</td>
<td>-</td>
<td>-</td>
<td>10.0</td>
<td>1,353.3</td>
<td>23,853.5</td>
<td>104,327.2</td>
</tr>
<tr>
<td>St. Lucie</td>
<td>53,003.8</td>
<td>52,510.3</td>
<td>1,316.1</td>
<td>-</td>
<td>255.1</td>
<td>851.0</td>
<td>940.8</td>
<td>108,877.1</td>
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<tr>
<td>Volusia</td>
<td>131.3</td>
<td>17,417.3</td>
<td>-</td>
<td>10.0</td>
<td>7.7</td>
<td>773.8</td>
<td>36.2</td>
<td>18,376.3</td>
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<tr>
<td>Total</td>
<td>112,531.1</td>
<td>209,659.4</td>
<td>1,316.1</td>
<td>10.0</td>
<td>293.5</td>
<td>3,223.5</td>
<td>25,483.2</td>
<td>352,516.8</td>
</tr>
</tbody>
</table>

The County Alliance for Responsible Environmental Stewardship (CARES) program highlights efforts by farm owners to improve natural resource management. The CARES program is sponsored by the Florida Farm Bureau. FDACS provides support for the program in evaluating BMP implementation and nominating growers for the award. Each county Farm Bureau branch selects the award recipients, who are given a sign to post on their properties identifying them as good stewards. Eighteen growers in the Indian River Lagoon area have received this award. More information about them and CARES can be found at www.thisfarmcares.org.

For more than a decade, partnership-based Mobile Irrigation Labs (MILs) have been operating free of charge throughout the state. MILs provide expertise in analyzing irrigation systems and educating agricultural, commercial, and residential property owners on how to improve water use efficiency. They give recommendations on the improvement of existing irrigation systems and equipment, and inform their customers and the public on water conservation, irrigation planning, and irrigation management. Three MILs operate within the Indian River Lagoon Region: the Treasure Coast Resource Conservation and
Development Council MIL via the St. Lucie Soil and Water Conservation District (agricultural), which serves Indian River, St. Lucie and Martin counties; the East Central Florida Resource Conservation and Development Council MIL (agricultural and urban), which serves Brevard County; and the Floridan Resource Conservation and Development Council MIL (agricultural) which serves Volusia County.

Since July 2009, these MILs have conducted at least 252 evaluations on approximately 4,200 acres of agricultural lands associated with those counties, resulting in approximately 1.1 million gallons a day (mgd) of actual water savings.

The Florida Department of Environmental Protection (FDEP) has contributed funding to a number of local government projects designed to improve water quality in the Indian River Lagoon (IRL) and its tributaries. FDEP has staff involved with research and restoration activities benefiting the Indian River Lagoon as well.

Indian River Lagoon Basin
The Basin Management Action Plans for the IRL stakeholders to implement actions toward achieving the nutrient TMDLs was adopted by FDEP in January 2013. FDEP held an annual update meeting in May 2014 to update stakeholders regarding implementation and research activities in the basin. FDEP also conducted public meetings to review and discuss technical details related to model updates and phase II planning for the BMAP in July and December of 2014. The next technical meeting is planned for April 2015.

Research and Modeling:
FDEP, in conjunction with the SJWMD, continues seagrass mapping efforts in the lagoon. The lagoon-wide mapping effort provides an overall picture and trends of the seagrass resources in the IRL. These maps serve as important management tools for obtaining a current inventory of this resource, identifying “healthy” areas that may deserve special protection efforts, and identifying potential “problem” areas that require further investigation.

FDEP has been working with Brevard County, Brevard County’s consultants, and other agencies including SJRWMD to refine the Surface Water Iterative Loading (SWIL) model. An advantage of the SWIL model is that it simulates surface runoff and baseflow separately so the loading can be split to help determine how best to treat the loads. The SWIL model can also be used to conduct high frequency data analysis since it has monthly instead of annual loading information. The Department is very pleased with the SWIL model, and all comments raised on the model have been addressed. Modeling efforts have been completed however new nutrient targets have not yet been established.

Projects:
The City of Melbourne received State Revolving Fund (SRF) loans from FDEP in 2013 and 2014 totaling approximately $7.5 million to make energy efficiency improvements at the 7.0 million gallon per day D.B. Lee water reclamation facility. Construction began in March of 2015 and is expected to be complete in January of 2016.

The City of Cape Canaveral received SRF loans from FDEP in 2013 and 2014 totaling approximately $6.7 million to complete various improvements to the wastewater treatment plant including the rehabilitation and upgrade of the oxidation ditch, the rehabilitation of the sludge belt press, and the
installation of diffusers in the equalization tank. Also included in these loans are stormwater improvements that include pipe replacement, streetscaping, and ditch dredging. Construction is expected to begin in the spring of 2015 and is expected to be complete in the fall of 2016.

The St. Johns River Water Management District was awarded state funding in 2014 for an amount of $10,000,000 for the design, planning and dredging to remove 150,000 cubic yards of muck from the Eau Gallie River, which will remove approximately 288 tons of TN and 62 tons of TP.

The City of Titusville was awarded $800,000 of state funding in 2014 and was awarded $388,825 of a 2014 319(h) grant for the Titusville Draa Field Water Quality Improvement Park. The treatment system consists of a 4-acre enhanced wet detention pond, permeable reactive barrier, constructed wetland, pond aeration, pervious paving. The park will offer passive recreation with a multiuse trail, environmental education opportunities, and will serve as a trailhead for the Rails-to-Trails pathway that is directly adjacent to the site. In addition, the Draa Field Stormwater Park will provide flood protection for a 106-acre drainage basin that has historically been subjected to flooding.

The City of Cocoa Beach was awarded state funding in 2014 for $400,000 and was awarded $544,550 of a 2014 319(h) grant for the Minuteman Corridor Stormwater LID and Streetscape Improvement Project. This project will implement low impact development BMPs including rain gardens, rain tanks, tree filters and pervious pavers for a 22.18 acre watershed (subbasins B-1 through B-4 that share a single outfall to the Banana River Lagoon). The project will be implemented from the dune line westward for five blocks to Cedar Avenue.

Brevard County Natural Resources management Department was awarded a TMDL grant in 2014 in the amount of $16,752 for the Merritt Ridge Pond Floating Vegetative Island. This project consists of installing a Floating Vegetated Island (FVI) on one of two adjacent existing wet detention ponds constructed by Brevard County along Fortenberry Road as retrofit projects to reduce loading to a nutrient impaired segment of the Indian River Lagoon.

St. Lucie West Services District was awarded a TMDL grant in 2014 for an amount of $182,150 for a project involving the modification of an isolated wetland into an enhanced stormwater pollution runoff zone and natural preserve that will assist in detaining and treating stormwater runoff. This stormwater best management practice relies upon natural processes, such as microbial activity, filtration, infiltration, and de-nitrification, nutrient reduction and evapotranspiration to enhance water quality.

St. Lucie Basin
The Basin Management Action Plan for the St. Lucie River and Estuary was adopted in May 2013. This plan is a collaborative effort of Martin, Okeechobee and St. Lucie counties; and multiple cities, water control districts and other stakeholders. FDEP held a BMAP annual update meeting in August 2014 to update stakeholders on BMAP progress and discuss various projects being implemented by local agencies.

Research and Modeling:
FDEP, in conjunction with the SFWMD, has initiated an effort to update the St. Lucie Estuary Watershed Model (WaSH Model) to better meet the needs of the BMAP. This update will include enhancements to the modeling code, updates to the water quality component, and further model calibration.

Lake Okeechobee Basin
In December of 2014, FDEP adopted the Lake Okeechobee BMAP, which targets restoration of the lake, which is currently impaired for total phosphorus. The BMAP sets a multi-year plan in place for
restoration of the lake, and includes over 700 million dollars’ worth of projects aimed at reducing phosphorus pollution from the surrounding landscape. The BMAP estimates that over the first five years over 100 metric tons of phosphorus will be eliminated from entering the lake, a direct result of both projects and actions taken by the coordinating agencies and various partners working towards the restoration goal.

Research and Modeling:
FDEP, in conjunction with the coordinating agencies implementing the Lake Okeechobee BMAP, have agreed to update the Watershed Assessment Model or WAM model. The first phase of this update will include incorporating the southern watersheds into the overall WAM model and refinements to the overall model outputs based on new data.

St. Lucie County

Indian River Estates /Savannas Restoration - The Project includes construction of a stormwater collection system, pump station and large treatment cell for an 1800 home subdivision adjacent to the Savannas State Preserve. The Project will collect all of the stormwater runoff and provide treatment prior to discharge to the Savannas water body. The treatment system includes alum injection and nutrient removal with aquatic vegetation. Construction of Phase 2 was recently completed in October, 2014. We are currently working with the Contractor to complete punch list items and final acceptance of the Project construction. Total cost $14.5 million.

Paradise Park Storm Water Retrofit(s) – Construction of stormwater collection systems, swales, dry detention areas, and paved roadways within an older, unimproved subdivision that predates the requirements for water quality treatment. The Project outfalls directly to the Indian River Lagoon. To date, we have completed 3 of the 5 phases, and the 2 remaining phases require grant funds to complete. An Issues Team grant was recently awarded, but additional funds are needed to construct the next phase. We are currently seeking additional grant funds from the SFWMD Cooperative Funding Program and the FDEP 319 Grant Program. Each Phase costs about $2 million, including: land acquisition, design and construction. The total cost to complete Paradise Park is about $4 million.

Harmony Heights Storm Water Retrofit(s) – Similar to the Paradise Park Project and requires grant funding for land acquisition, design, permitting and construction. This Project includes 5 phases, and we have completed ½ of the first phase. Each Phase costs about $2 million, including: land acquisition, design and construction. The total cost to complete Harmony Heights is about $9 million.

San Lucie Plaza Retrofit(s) – Similar to the Paradise Park and Harmony Heights Projects, improving an older, unimproved subdivision that predates the requirements for water quality treatment. The Project outfalls directly to the Indian River Lagoon. The Project includes 5 phases, and requires grant funding for land acquisition, design, permitting and construction. We are currently pursuing construction of the first phase, and construction funds are pending an Issues Team grant and State appropriation in FY 15. Funds totaling $170 thousand have been spent so far in engineering and design.

Indian Hills Recreation Area and Storm Water Project – A partnership project including multiple Agencies to construct a high-level stormwater treatment system that serves a 3.5 square mile urban drainage basin in the City Limits of Ft. Pierce. The storm water elements of the Project are 75% completed including: construction of lake expansion, outfall structures, floating vegetative mats and pervious parking areas. The Project has direct outfall to the Indian River Lagoon and it will include an
alum injection system to provide high levels of treatment to storm water. The Project improvements total $4.7 million.

**White City Drainage Improvements - Citrus/Saeger** -- This project’s basin is 41 acres consisting of Medium Density Residential and Upland Hardwood Forest-Brazilian Pepper. The existing basin is poorly drained and experiences significant flooding due to the inadequate conveyance provided by the existing ditches/culverts and generally very low finish floor elevations. The Citrus Saeger retention pond site is ideally situated between residential areas and the North Fork of the St. Lucie River on County-owned land. The project involves the addition of a 4-acre detention lake, upgrading the storm water conveyance system and will utilize ‘Floc Logs’ (Polyacrylamide) to reduce erosion and nutrient loads. The treatment train will consist of improved grassed swales collecting and storing stormwater. The run-off will be then be conveyed to the wet detention lake where twin retrofitted solar powered Pond Doctors™ will be installed to pump water through the ‘Floc Logs.’ The basin will be controlled by a single control structure, which discharges to the existing outfall ditch to the North Fork of the St. Lucie River. It is anticipated that the project will reduce pollutant loadings to the North Fork of the St. Lucie River and the IRL. Water quality monitoring and education are planned for the project. The project’s total cost is estimated at $2,264,980. Project is ongoing and will be complete November 2015.

**Platt’s Creek Compensatory Mitigation Project** -- The County is collaborating with the City of Port St. Lucie to construct a joint mitigation project on the Platt’s Creek Property. In 1999, the County received a $1 million grant to purchase the 100-acre Becker Grove Property at Platt’s Creek and Sunrise Boulevard. This tributary is the “dirtiest” in the county. We initiated design and permitting of a project to construct a combined stormwater retrofit and a mitigation bank. The Project consists of a 20-acre stormwater treatment system with an 82-acre mitigation bank project along the shoreline of the North Fork of the St. Lucie River. Permits were obtained for the combined project in 2003 and boasts a 16 acre wet detention lake and a quadraplex pump station with Alum injection that treats and stores waters from the 1000 acre basin prior to discharge to the River. The $2.7 million stormwater project was constructed in 2004, and is currently operational.

In 2008, the County extended the permits for another 5-year term to allow for completion of the mitigation project, however funding became limited during this time. In November, 2009 the City of Port St. Lucie approached County Staff to discuss the concept of a joint mitigation project at Platt’s Creek. The City needs wetland or “riverine” mitigation for the environmental impacts associated with the Crosstown Parkway Extension Project.

A Memorandum of Agreement was approved by the County and City in 2010 that outlines the responsibilities of each to amend the permits, construct and maintain the joint mitigation project. The City will provide up to two million dollars and construct the PROMA. The County will be responsible for any remaining costs and operate the site. Each will receive half of the credits generated. Construction began summer 2014 with a 300-day construction schedule. Total construction cost for the PROMA is expected to be $ 2.8 million.

**Merritt Island National Wildlife Refuge**

**Boating safety and Resource Protection:**
Two Federal Wildlife Officers spent over 250 hours patrolling the Indian River Lagoon (IRL) by boat and enforcing State, Federal and U.S. Coast Guard regulations. At least four hours each workday were spent checking bank anglers, totaling over 1,000 hours annually. The officers also worked details with the Florida Fish and Wildlife Conservation Commission (FWC), and Brevard County Sheriff (marine sanitation, BUI, resource checks, and navigation/safety checks). Over 150 citations and warnings were
issued for fishing violations, 44 citations and warnings were issued for boating violations and 13 citations and warnings were issued for manatee zone violations. These Federal Wildlife Officers average five search and rescues each year on the IRL. Our boating hours dropped this year, but our fishing citations and warnings were up from 100 to 150. Manatee zone violations increased from 10 to 13. ($100K)

**Management of Impounded Marsh and Environmentally Sensitive Lands:**
MINWR manages 26,000 acres of impounded wetlands (55 impoundments; 140 miles of levees; 430 water control structures) to enhance waterfowl and migratory bird food production, control mosquito breeding, and enhance healthy salt marsh habitat. Water levels and salinity are monitored and managed. Staff monitored the productions of submerged aquatic vegetation in the impoundments managed for wintering waterfowl. Management actions are conducted in coordination with conservation initiatives such as the North American Waterfowl Management Plan, U.S. Shorebird Plan, and North American Waterbird Conservation Plan. The Refuge is conducting an experiment in subsided marsh restoration in cooperation with the SJRWMD and Brevard County Mosquito Control. Experimental cells in the T-10-D impoundment are being filled to evaluate methods for raising the marsh floor elevation. (50K)

The refuge monitors and maps invasive non-native plant infestations to track effectiveness of herbicide treatments and ensure follow-up treatments. Staff, volunteers and contractors treated 1,100 acres of exotic plants ($265K).

Prescribed fire is the primary habitat management tool for coast scrub habitat. Between October 2013 and September 2014, 4,000 acres were prescribed burned on MINWR ($200K)

Approximately 3,000 feral hogs were removed from the refuge by staff and permitted trappers ($35K).

**Endangered and Threatened Species Management**
Population monitoring was conducted on several federal threatened and endangered species: Florida scrub jays, sea turtles, and Southeastern beach mice. Scrub jays were monitored to determine their response to the prescribed burn program. Beach mice were surveyed to determine the presence/absence of the species across the coastal landscape and correlate with desired habitat conditions (partners: NPS, NASA, Air Force). This past summer, 1114 loggerhead, 95 green and 14 leatherback sea turtle nests were counted along the six miles of refuge beach. Post emergence analyses were conducted to determine hatching success. Predation of nests was monitored and predator control measures implemented to minimize nest predation. ($155K)

**Public Involvement and Education**
MINWR hosts over 1 million visitors each year. The refuge conducts environmental education programs for local schools and on-site and off-site outreach programs. Many of the visitor activities/programs highlight the IRL. Interpretive signs at boat ramps, the Manatee Observation Deck, and Haulover area provide information to visitors about the IRL.

**Cleanup Projects**
The Refuge has an “Adopt an Area” program with 20 groups conducting four cleanups per year at designated sites. Additionally, 10 scout groups conducted cleanups at Dummitt Cove and Haulover Canal. New York Mellon Bank employees conducted a cleanup on October 7, 2014 for six hours and their company donated $2,300 to the Merritt Island Wildlife Association. Several families also conducted cleanups on the refuge. Volunteers empty trashcans at five refuge boat ramps, two times a week ($10K).

In collaborating with Keep Brevard Beautiful, the Refuge will be conducting a Trash Bash on April 14, 2015 and the International Coastal Cleanup in September 2015 at Haulover Canal. The refuge maintains monofilament containers at seven locations on the Refuge.
Interpretive Programs, Workshops and Festivals
In partnership with Anglers for Conservation, the Refuge hosted two “Hook Kids on Fishing” programs where approximately 200 children and their family members attended (October 1, 2014 and March 21, 2015). Refuge staff and volunteers provide scheduled manatee programs at the Manatee Observation Deck and Bairs Cove boat ramp throughout the year ($5K).

Thirty interpretive programs pertaining to the lagoon will be presented during the reporting period.

Youth Hunt
The Refuge hosted United Waterfowlers’s Youth Hunt Workshop at Sendler Education Pavilion on January 31, 2015

Projects
The Refuge installed two kiosks that display IRL informational panels, bulletin boards and brochure racks at Haulover Canal for educating anglers and boaters about the IRL ($11K).

Environmental Education
Approximately 3,000 students participate in various environmental education programs each year. Seventeen environmental educational programs pertaining to the IRL will be presented for the period of October 2014 through May 2015. Program topics include seining, water quality, mangroves, manatees, and wetland management. In addition, Brevard Zoo conducted thirteen Lagoon Quest Programs at the Refuge’s Sendler Education Pavilion, which is located along the shoreline of the lagoon. This program involves 4th grade students participating in seining and water quality activities.

Signs
The Refuge maintains signage for the Poll/Troll Zone in Mosquito Lagoon, IRL informational signage at four boat ramps, Bird Island Interpretive signs and kiosks located at Haulover Canal and manatee and IRL signs at the Manatee Observation Deck. In addition, manatee, sea-grass and IRL brochures are given out at the refuge visitor center and at kiosks located at several locations on the Refuge.

Brevard County
During the past year, Brevard County has initiated and/or completed numerous stormwater treatment and outreach projects.

Stormwater treatment projects completed in 2014 include the following:

Pine Island Phase I and Phase II Wet Detention Pond: This project improves water quality and reduce the duration of flooding within the North Merritt Island drainage basin. The project was divided into two phases to modify each of two existing borrow pits. The land is owned jointly by the St. Johns River Water Management District and the Brevard County Environmentally Endangered Lands program. Phase I involved expansion and re-grading of the north borrow pit, installation of the first pump, and fabrication of a diversion weir within the Pine Island Road ditch to redirect stormwater runoff into an 80 acre borrow pit for water quality treatment. FDEP 319(h) & TMDL grant funding programs provided $1,380,000 toward construction of Phase I of the project, which was completed in September 2012. Phase II of the project involved expansion and excavation of the 26 acre south borrow pit and installation of two more pumps to divert additional flow to the pits from the Pine Island Road drainage ditch which will provide additional storage for water quality treatment and flood control. The FDEP 319(h) grant-funding program provided $800,000 toward construction of Phase II of the project, which was completed in June 2014.
Fortenberry Wet Detention Pond: This project involved multi-phase construction of a 22.3-acre regional stormwater treatment pond on Merritt Island. In September 2009, the Merritt Island Redevelopment Authority (MIRA) purchased a 50-acre parcel to accommodate a regional water quality treatment/stormwater management system to serve roughly 170 commercially developed acres along the south side of SR 520. The first phase of construction, completed in November 2012, excavated nearly 11 acres of pond and provided immediate potential for economic redevelopment along the 520 corridor. Excavation of the Phase II area, an additional 11.65 acres, began in the fall of 2013 using a combination of available stormwater assessment revenues, grants and commercial paper. Construction of Phase 2 was completed in 2014.

Valkaria Lakes Wet Detention Pond: This project converted three existing borrow-pits into a wet detention system. The ponds were designed to treat runoff from a 421-acre primarily residential watershed basin to improve the water quality of stormwater runoff entering the Indian River Lagoon. The stormwater pond system attenuates flooding and provides water quality treatment prior to discharge through the Valkaria Road ditch into the Indian River Lagoon. The system provides approximately 52 acre-feet of treatment volume or 1.3 inches per acre of drainage area. Construction of the pond system, which is equivalent to 22 acres, was completed in 2014.

Stormwater projects with construction underway include the following:

Crane Creek/Lamplighter Phase II: This project will redirect additional freshwater flows to the St Johns River and away from the IRL by adding additional conveyance improvements under I-95 and by routing stormwater through multiple stormwater treatment ponds. Construction of this project, at a cost of approximately $2.9M, will be completed in May 2015.

C-1 Rediversion: This project will pump 14% of the freshwater flow from the C-1 Canal toward the St Johns River by upgrading existing pump stations near the western end of the C-1 Canal. The C-1 Canal was originally constructed to drain natural wetlands for agricultural use and has been maintained for flood protection. The canal serves a 53,777-acre basin by collecting flow from approximately 300 miles of feeder ditches and canals. Brevard County has collaborated with SJRWMD to fund installation of two 100hp, 36-inch axial pumps, rated at 50 cubic feet per second (cfs), as well as the associated walkway expansions, electrical connections and electrical services required for this upgrade. The cost share split of the project ($547,820 total) was 50% FDEP/50% Brevard County. Completion of the pump installation is anticipated to occur in 2015, with grant-required monitoring and outreach continuing for a year thereafter.

Wheeler Wet Pond #2 (aka Fleming Grant Pond): This project will treat stormwater collected from the Fleming Grant Road ditch in Micco. Additionally, a layer of denitrification bioreactor media is being added to the perimeter slopes of the wet detention pond to increase treatment efficiency. This project is being constructed through a partnership with the SJRWMD. The District owns the land and will oversee construction. The County is assisting in the site design process and with funding of construction of Wet Pond #2. A cost share of $625K is being provided by a state grant. Construction will be completed in 2015.

Baffle Box Retrofits: Historically, approximately 80 first generation sediment collection boxes were installed throughout the county in areas where land was not available for larger, more effective, stormwater treatment projects. Many of the original boxes were designed solely to collect sediment. Research by the Florida Department of Environmental Protection (FDEP) (Smith and England, 2010) showed that the first generation boxes are minimally effective for reducing nutrients from stormwater runoff. However, second generation baffle boxes with debris collecting trash screens were demonstrated to provide 19.1% reduction for total nitrogen (TN) and 15.5% reduction for total phosphorus (TP) by removing organic debris from the water column. This project is retrofitting seventeen (17) of the existing
first generation baffle boxes by installing trash screens that will upgrade these boxes to second generation baffle boxes. The boxes are located County-wide (Haverhill Road, Manth Avenue, Alamanda, Rivershore Drive #1848, Rivershore Drive #1925, Cedar Lane, Lucas Place, Indian River Isles, McIver Lane South, Franklin Avenue 651, Third Avenue, Fourth Place, Thrush, Ocean Boulevard, Corey Road, Riverview Lane #430, and Fiske at Green). During the retrofit process, seven of these baffle boxes will also undergo entryway modification to improve the safety of staff performing future maintenance activities. The contractor has been awarded the work and the preconstruction meeting is scheduled. Upgrades will be complete in 2015. The cost share split of the project ($237,004 total) was 49% FDEP/51% Brevard County.

**Micco I Project:** This project consists of constructing 800 LF of exfiltration pipe with sump inlets to provide treatment for an 8 acre drainage basin and a baffle box to provide additional treatment to a 37 acre drainage basin. A denitrification wall component was added to the exfiltration design and denitrification media has been added to an elongated baffle box design to enhance nutrient removal effectiveness. These basins currently discharge untreated stormwater into the Sebastian River and the Indian River Lagoon. The cost share split for the overall project cost of $630,000 is 42% FDEP/58% County. Project construction is underway and will be completed in 2015.

**Brevard County anticipates that the following stormwater projects will be constructed during 2015:**

**Johnson Junior High School Pond Retrofit** – This project will treat runoff from 71 acres of industrial and open land use (70% and 30%, respectively) utilizing a treatment train consisting of a retention pond, a denitrification bioreactor and phosphorus binding baffle filters. Runoff from the project area drainage basin currently receives minimal treatment in an undersized pond. The addition of a treatment train to the pond will reduce total suspended solids, total nitrogen, total phosphorus, copper, iron, and zinc pollutants from entering the Lagoon. The cost share split of the project ($484,200 total) was 49% FDEP/51% Brevard County.

**Vegetation Harvesting:** In 2014, Brevard County was awarded appropriations from the Legislature for $800,000 for the purchase of an aquatic vegetation harvester and harvesting activities, salary for an equipment operator, toxicity mapping by citizen scientists, and professional consulting and laboratory testing services to measure nutrient reduction. Acquisition of the harvester is underway with harvesting anticipated to begin in 2015.

**Street Sweeping and BMP Clean-Out:** Street sweeping and BMP clean-out operations were contracted to vendors in early 2015. As a result, street sweeping frequency has increased to a monthly basis and BMP clean out has increased to quarterly. Increased sweeping and clean out operations maximize debris removal from County streets and drainage infrastructure. It is anticipated that debris, TSS, TN, TP, trash and other solids entering the Lagoon and other water bodies will be substantially reduced.

**Kingsmill Stormwater Improvements:** Design of the Kingsmill project is currently underway. This project will provide drainage improvements in the Kingsmill/Aurora Road drainage area and join to the Upper Eau Gallie drainage improvements that were completed west of Turtlemound Road in 2009. Improvements include upsizing culverts, channel improvements, and an additional box culvert under Wickham Road. The City of Melbourne is providing $250K of funding assistance through a Joint Participation Agreement with the County. Total cost of the project is anticipated to be approximately $1.8M.

**Merritt Ridge Pond Floating Vegetative Island:** This project will install Floating Vegetated Islands (FVI) covering 5% of the water surface of a 7.7-acre pond constructed by Brevard County along Fortenberry Road as a retrofit project. The County will harvest and replace the FVIs semi-annually to
remove an additional 20% of the pollutants from the pond. The cost share split of the project ($238,270 total) was 49% FDEP/51% Brevard County.

**Muck Removal:** In 2014, Brevard County received an appropriation of $10 million from the Florida Legislature to remove legacy muck deposits from the Lagoon. The County contracted with a team of consultants to identify, design and permit five (5) high priority muck removal areas and contracted with a team of researchers at Florida Institute of Technology (FIT), per Legislative intent, to document and analyze ecological responses of the national estuary to muck removal. Five (5) priority muck removal locations were selected including: (1) the Mims Boat Ramp; (2) Sykes Creek; (3) Cocoa Beach; (4) Grand Canal, and; (5) Turkey Creek. These sites can be seen on the County’s website at [http://www.brevardcounty.us/NaturalResources/DredgingProjects](http://www.brevardcounty.us/NaturalResources/DredgingProjects). In 2015, the Brevard County Muck Dredging Project will remove up to 350,000 cubic yards of muck soils from sites within the Indian River Lagoon, the Banana River Lagoon and associated tributaries. This first year of dredging will remove up to 672 tons of TN and 144 tons of TP, which are contained within the muck deposits. Major components of the project include: hydro acoustic survey and subsurface mapping of muck, dredging design and permitting, sediment management design and permitting, dredging, sediment management operations, and site cleanup, restoration and project closeout. Major project components will be carried out as necessary for each site location selected. Site specific construction plans will be established to maximize the use of existing data and any previously issued authorizations. Project component costs will vary by location and will be dependent upon muck volume, general local characteristics, and proximity to dewatering sites.

Project status varies by location, with each site presently in a different phase of the design/development process. State permits for removing major muck deposits from the Palm Bay and Cocoa Beach sites have been approved and federal permits are pending with active dialogue on appropriate permit conditions. Bid document preparation is underway with project advertisement in April 2015 for Turkey Creek; less than one (1) year after appropriation. Cocoa Beach is also anticipated to go to bid in the spring with environmental dredging to begin in the summer. Muck removal activities including final acquisition of permits, completion of bidding, dredging of Turkey Creek and Cocoa Beach in 2015, and continued progress for the remaining priority sites.

The Brevard County Natural Resources Management Department offered the following outreach/educational programs and events in 2014:

**Education Efforts:** Stormwater Outreach activities remain a vital component of the County’s efforts to engage our community in activities that prevent and reduce pollution through source control as well as restoration. Outreach is conducted in-house and through partnerships with nine (9) municipalities within the County, the Brevard Zoo, and Good Education Solutions, a contracted public outreach firm. A multi-member "BLUE LIFE" partnership works to provide uniform messages throughout a large area of Brevard County focused on improving the health of the Indian River Lagoon. "BLUE LIFE" outreach conducted during 2014 through the partnership included:

- Outreach to Children: 118 presentations to 3,270 children
- Outreach to Adults: 26 presentations to 6,125 people
- Special Events: 16 events attended by 6,298 people

In-house outreach efforts in 2014 included implementation of a variety of additional activities and programs including three (3) Florida Stormwater Erosion and Sedimentation Control workshops for the Construction Industry through collaboration with multiple partners; fun, hands-on Rain Barrel workshops conducted through a partnership with the Marine Resources Council; Florida Yards and Neighborhoods/My Brevard Yards workshops conducted through a partnership with the University of Florida/IFAS Brevard Extension Service; oyster gardening and oyster reef building through a partnership
with the Brevard Zoo; outreach activities conducted at Movies-in-the-Park events through a partnership with the Brevard County Parks and Recreation Department, and; in-house continuous improvement of pollution prevention and good housekeeping coordination with County departments as well as public outreach through the County’s website.

Oyster Gardening and Oyster Reef Building

In 2014, Brevard County, in partnership with the Brevard Zoo, established a highly successful citizen science oyster gardening program whereby residents with access to the Lagoon shoreline volunteered to build oyster gardens (built metal enclosures), hang the gardens under their private docks, care for their gardens weekly to propagate and raise juvenile oysters and collect weekly data. The program was extremely popular and raised over 50,000 young adult oysters that were used to populate oyster reefs at three (3) selected pilot sites within the Lagoon in November. The existing oyster gardening and reef building project will continue into 2015 and beyond. Brevard County received appropriations from the State Legislature for $410,000 to continue the program for a second year and evaluate the nutrient removal efficiency of oyster reefs within the Indian River Lagoon. Backed by state appropriations, a Memorandum of Agreement (MOA) for the Indian River Lagoon Oyster Restoration Project was executed by the Brevard County Board of County Commissioners, the Brevard Zoo, the University of Central Florida (UCF) and the Board of Regents of the Nevada System of Higher Education on Behalf of Desert Research Institute for Oyster Gardening, Oyster Reef Building and Monitoring. Through the MOA, Brevard Zoo will continue to engage the Brevard County community in a citizen-based oyster propagation program to raise additional juvenile oysters to expand oyster reefs at the three (3) pilot sites in the Indian River and the Banana River Lagoons. Denitrification measurements will be conducted by the Desert Research Institute. Oyster growth, survival and recruitment will be documented quarterly throughout 2015 by UCF. The three (3) pilot oyster reefs within the Lagoon are anticipated to help reduce nutrient levels while the data collection efforts are designed to guide future shellfish restoration efforts in the IRL.

Rain Barrel Program: One of the County’s popular outreach programs is Rain Barrel Workshops. Rain barrels are a proven method to disconnect roof drainage from impervious roof areas, allowing roof runoff to be used for yard irrigation. For several years, the Brevard County Natural Resources Management Department has been collaborating with local garden centers, the University of Florida Brevard County Extension Services, the University of Central Florida Stormwater Academy, and Community Matters, Inc. to hold rain barrel workshops. These workshops provide residents, who are interested in putting rainwater to use in their landscapes and gardens, the opportunity to create their own rain barrels. Participants learn about the benefits of collecting rain while enjoying hands-on construction of 55-gallon rain barrels. Participants receive a kit that includes a recycled barrel, faucet, flexible downspout extender, leaf filter, and a DVD of instructions for building, installing, and painting their barrel. At these workshops, staff provides tools, instructions, and coaching for this hands-on experience. Participants take a picture of their rain barrel after it is installed at home and submit it so we can track the abundance and location of rain barrels in the community. In addition to giving instructions and providing assistance during assembly, participants are also presented with stormwater basics and introduced to common homeowner best management practices. Due to the popularity of these workshops, about a dozen are held annually and are conducted across the County during day and weekend events.

Florida Yards and Neighborhood/My Brevard Yard:

For several years, The County has supported the Florida Yard Yards and Neighborhoods (FYN) Program in cooperation with the University of Florida/IFAS, Brevard County Extension Service. The program has promoted the implementation of the nine (9) Principles of Florida Friendly Landscaping and encourages residents to certify their yards as Florida Friendly. In 2014, the County strengthened its partnership with
the Extension Service through the creation of the “My Brevard Yard” program, an expansion to the existing FYN program. “My Brevard Yard” includes hands-on workshops tailored to educate participants about maintaining a healthy lawn while complying with local fertilizer ordinances and providing information about best management practices for fertilizer and irrigation. Participants learn how to calibrate and correctly use a fertilizer spreader, calculate the correct amount of fertilizer, correctly set irrigation timers, and calibrate an irrigation system. The combined program offers comprehensive information for participants to establish and maintain Florida friendly landscaping in accordance with local conditions and ordinances. The program also includes follow-up site visits for participants, upon request. During the visit, a UF/IFAS agent collects a soil sample for lab analysis, tests the salt content of on-site wells if used for irrigation, checks the irrigation system and trains the homeowner on setting the irrigation timer. Based on the results of the soils tests, the UF/IFAS agent makes site specific recommendations for fertilizer use, irrigation and Florida-friendly landscaping.

Website: The County continues to maintain an on-line Atlas of stormwater projects located on its website. The site uses Google map technology to illustrate graphical information to the public about the distribution of projects in the viewer’s area of interest, the different types of BMPs, and provides a link to specific information about each project. Project specific information includes year built, type of BMP, project cost, project benefit, and lists any funding partners. A link to the County’s Atlas is also included on the homepage of the County’s public outreach “BLUE LIFE” website. The website also offers stormwater guidelines for homeowners and contractors and a calendar of events. The URL for the website is http://www.brevardcounty.us/NaturalResources/Home:

Stormwater Training: The Natural Resources Management Department continued to collaborate with the Florida Department of Environmental Protection and the City of Palm Bay Public Works Stormwater Department to offer certification classes for construction inspectors and other construction industry employees on BMPs that reduce erosion on construction sites.

Pet Waste Management: Brevard County continued outreach through local veterinarians to encourage pet owners to dispose of pet waste properly. Bacteria and nutrients from pet waste have been identified as a significant pollutant of the Eau Gallie River and Crane Creek, major IRL tributaries. “Pick Up After Your Pet” dog leashes were distributed at area “dog” events such as Paws in the Park.

- Staff presented programs that described flooding, water quality issues and Best Management Practices. Numerous presentations were made to various civic gatherings, large and small.
- Watershed science was presented to 8-12 year old students at the Brevard County Public Libraries as part of the summer reading program.
- Staff participated in festivals and events such as the Eco-Friendly Fest at Brevard Zoo, the Secondary Science Teacher Conference, the Ocean Reef Festival, the Viera Wetlands Festival, Waterfest and Earth Day at the Enchanted Forest.
Volusia County Activities affecting the Mosquito and Indian River Lagoons during April 2014 to March 2015:

- In June 2014, the Volusia County Council convened a Water Quality Workshop at the Ocean Center. The County and many cities presented and discussed their ongoing water quality efforts in order to cooperate and collaborate on improving water quality.
- In July 2014, the Volusia County Council enacted a stringent fertilizer ordinance that is stricter than the state model. The ordinance includes a summertime fertilizer ban, a requirement for minimum 50% slow release nitrogen, zero phosphorous unless a tissue or soil analysis indicates a need, and a 15-foot buffer zone from water bodies.
- In September 2014, the Volusia County Council approved a Resolution, resolving to improve water quality county-wide.
- In September 2014, the Environmental Management Division (EMD) hosted the International Coastal & Halifax/Indian River Cleanup. 942 adults and 259 children (under 12) volunteered to clean up trash along the shores of the beach, Halifax River and Indian River Lagoon. Volunteers were located at 41 different sites and they removed over 7,100 pounds of trash on foot, kayak, paddleboard, canoe, motorboat and by scuba.
- EMD staff has monitored numerous sites in Mosquito Lagoon for water quality since 1988. Monthly and quarterly collections have been continuous for the northern stretches of the lagoon from Ponce Inlet south to Oak Hill, with sites along the Intracoastal Waterway as well as at points eastward near Bethune Beach and south of George’s Bar. Several points near the Intracoastal Waterway lie near marinas, and some are near shellfish harvesting areas. Sites currently sampled are widely dispersed in the Volusia segment of Mosquito Lagoon to provide a good data set for modeling purposes for water quality requirements.
- EMD staff took water samples in cooperation with the SJRWMD and Volusia County Mosquito Control on a marsh restoration project, restoring more productive salt marsh habitat where ditches used to be in Mosquito Lagoon.
- EMD convened a Water Education Task Team (WETT) to coordinate educational opportunities between all divisions and to focus on water related education through all education and outreach efforts. A course catalog was created listing all of the educational offerings within Environmental Management and identifies areas for improvement. A plan to develop additional multi-media materials to broaden our ability to educate our residents and visitors is underway.
- EMD participated in “Project H2O” – a consortium of NGO’s, Universities, Colleges, and other institutions with a focus on improving water quality.
- The Marine Science Center, located in Ponce Inlet, had 89,079 visitors, 1121 birds were admitted to the MSC bird rehabilitation center, 309 sea turtles were admitted to the MSC sea turtle rehabilitation center, 99 gopher tortoises and other reptiles were admitted to the MSC turtle hospital, and 9 weeks of summer camp educational programs were conducted.
- On February 5, 2015, the Volusia County Council adopted a Water Quality Plan that includes action items that address water quality in the Mosquito and Indian River Lagoons.
- Volusia County, in cooperation with DEP and the cities of New Smyrna Beach, Edgewater, and Oak Hill initiated discussions on the implementation of a Reasonable Assurance Plan on the Mosquito Lagoon. The RAP is a proactive approach and is purposed to address many of the issues that would need to be involved in the TMDL/BMAP process.
- The Volusia County Council approved the 2015 Legislative agenda that supports funding for water quality improvements that provide dedicated funding to improve surface water quality including in the Halifax/Mosquito Lagoon estuary.
Indian River Lagoon Research and Education

FAU Harbor Branch, with its scientific and technology expertise, ideal geographical location, and long history of research on the Indian River Lagoon (IRL), continues to be a strong contributor to finding answers to research questions regarding the many facets of the Lagoon. Harbor Branch researchers collaborate with other research institutions, federal and state agencies, not-for-profits, governmental bodies, and other interested parties to advance this research and education.

Projects and other activities related to the IRL in the past year include:

**Research:**

The Indian River Lagoon Observatory (IRLO): Biodiversity and Ecosystem Function of an Estuary in Transition – IRLO is a long-term, multi-disciplinary, ecosystem-based program, that addresses emerging issues of environmental health in the IRL ecosystem. Key components of IRLO include: (1) long-term ecosystem-based research, including high-frequency water quality and seagrass/macroalgal monitoring along a water quality gradient in the Central IRL initiated in 2005, that demonstrates both human impacts and the tremendous climate-related interannual variability in IRL water quality and will be used in models of estuarine health in the lagoon; (2) collaboration among various organizations working in the IRL, best exemplified by the Indian River Lagoon Symposium (see below); and (3) use of advance technology for observing long-term changes in the IRL, including developing a network of Land/Ocean Biogeochemical Observatories (LOBOs) which produce real-time data accessible via the internet. (Save Our Seas Florida specialty license plate: $200,986 – 10/1/14 to 6/30/15)

Land/Ocean Biogeochemical Observatories (LOBOs) for Intensive, Real-time Water Quality Sampling in the Indian River Lagoon – IRLO research and education activities are enhanced by deployment of LOBO units that provide real-time, high-accuracy, and high-resolution water-quality data through a dedicated interactive website (http://fau.loboviz.com/). Present funding is sufficient for a 13-unit network that is under development from Sebastian Inlet to the St. Lucie Estuary. These data provide scientists of various disciplines from many organizations reliable, continuous observatory data to better quantify and model relationships between environmental factors and biological processes in the IRL. They can also be used to follow the outcome of changes related to recovery measures and assist resource and policy managers with decision making. (Florida Department of Environmental Protection: $2,000,000 – 7/1/14 to 6/30/15; HBOI Foundation: $559,295 – 7/1/14 to 6/30/15)

Evaluating the Feasibility of Transplanting to Promote Seagrass Recovery in the Indian River Lagoon – Partnering with St. Johns River Water Management District, FAU Harbor Branch researchers established experimental plots in July 2013, at three sites that have shown no recovery following the unprecedented loss of seagrass due to the 2011 “super bloom.” Our initial results suggest that, in the absence of grazing pressure, environmental conditions present at all three sites are favorable for seagrass recovery. (SJRWMD: $30,000 – 10/1/14 to 9/30/15)

Ecology & Nutrition of Macroalgal Blooms in the IRL – Because persistent macroalgal blooms can reduce the prevalence and distribution of seagrass, FAU Harbor Branch researchers are studying the composition and seasonal variability of blooms and the nutrients fueling them at more than 20 sites throughout the IRL from Jupiter Inlet to the Mosquito Lagoon. (Save Our Seas Florida specialty license plate: $59,014 – 10/1/14 to 9/30/15)
Algal Blooms Investigation: Analysis of Submersed Aquatic Vegetation Tissue Nutrient Content and the Response of Drift Macroalgae to Extreme Levels of Salinity, Temperature and Light – This project, part of the Indian River Lagoon Algal Bloom Investigation (IRLABI), will provide a better understanding of macrophyte nutrient cycling in the IRL and how the disruption of this role may have contributed to the development and persistence of the severe phytoplankton blooms in 2011. (St. Johns River Water Management District: $261,998; 3/1/14 to 9/30/16)

Martin County Septic Tank Study – This study addresses interactions between onsite sewage treatment and disposal systems, groundwaters, and surface waters in the St. Lucie Estuary (SLE) and coastal reefs. Analyses will involve residential-area wells of varying depth; surface waters in the SLE, IRL, and nearshore coastal areas; sediments from the surface water sites; and macroalgae from the lower SLE, IRL, and coastal areas. (Martin County: $124,500 – 7/1/14 to 12/31/15)

Microbial Source Tracking in the IRL – Three years of monitoring bacteria levels in water and sediments at six Indian River Lagoon sites from northern Fort Pierce to northern Vero Beach indicate generally poor water quality, but the origin of the bacteria is not well understood. This project is working toward answers by employing tests designed to discern bacteria from human, agricultural, and wildlife sources. (Save Our Seas Florida specialty license plate: $25,000 – 7/1/14 to 6/30/15)

The Pathogenic Vibrios in the IRL and Their Potential Threat to Human Health – Bacteria in the genus Vibrio are common in coastal waters such as the IRL, and some species are known to cause disease in humans such as shellfish food poisoning and cholera. Because little is known about their presence in the IRL, this work is designed to detect three species known to cause illness, determine potential sources of infection, and assess whether seasonality is a factor. (Save Our Seas Florida specialty license plate: $12,500 – 7/1/14 to 6/30/15)

Estuarine Impacts on SLR: Determining the Effects of Changing Resource Management on Florida’s Northernmost Coral Reef – FAU Harbor Branch researchers have been studying the coral reef south of the St. Lucie Inlet to assess whether the freshwater discharges affecting the St. Lucie Estuary are harming the tropical coral reef species at their northern limit of distribution in the U.S. (Save Our Seas Florida specialty license plate: $200,000 – 7/1/11 to 12/31/15; Florida Sea Grant: $145,905, plus matches of $53,179 from FAU Foundation and $19,783 from Florida Fish and Wildlife Conservation Commission – 2/1/2014 to 1/31/2016)

Ventilation Rates of the IRL Through its Inlets – The exchange of water between the ocean and IRL is an important factor influencing the quality of water in the estuary, which in turn helps determine the favorability of conditions for the growth of seagrass, the development of harmful algal blooms, and the health of resident animals. This project employs a selection of underwater, surface, and aerial technologies to shed light on water exchange as well as the influence of precipitation fluctuations due to events and/or seasonal patterns on lagoon water quality. (Save Our Seas Florida specialty license plate: $51,462 – 7/1/14 to 6/30/15)

Sources of Nitrogen & Phosphorus Inputs to the IRL – To help determine how land-use changes are affecting the IRL and enable science-based management decisions, FAU Harbor Branch scientists are analyzing stormwater from tributary relief canals and rivers in Indian River County to measure concentrations and determine sources of nitrogen and phosphorus. (Indian River Lagoon National Estuary Program: $24,840, plus $7,664 in match from Save Our Seas Florida specialty license plate, $7,236 in match from FAU, and $1,961 of in-kind support from Marine Resources Council – 10/1/13 to 5/15/15)

Wild Dolphin Stranding Response, Care & Research – As a member of the NOAA National Marine Fisheries Service Marine Mammal Health and Stranding Response Network, FAU Harbor Branch is
responsible for responding to marine mammal stranding incidents in the IRL and near-shore ocean waters. The work took on added significance in light of a bottlenose dolphin Unusual Mortality Event declared by NOAA Fisheries due to elevated deaths in the central and northern IRL and offshore waters. (Protect Wild Dolphins Florida specialty license plate: $150,625 – 1/1/14 to 12/31/15)

**IRL Bottlenose Dolphin Photo Identification** – FAU Harbor Branch has been conducting photo identification studies of IRL bottlenose dolphins since 1996, and has identified more than 1,700 individual dolphins. Among the findings enabled by this data is identification of a distinct IRL stock now breeding its third generation since the study began, and insights into breeding and social behavior. (Protect Wild Dolphins Florida specialty license plate: $462,250 – 1/1/14 to 12/31/15)

**Factors Affecting IRL Dolphin Locational Preferences: Water Quality and Prey Aggregation** – FAU Harbor Branch researchers have been following the movements of Indian River Lagoon bottlenose dolphins since 1996, and this work is intended to shed light on the influences of water quality and the spawning of their preferred prey species. Water quality data will be provided primarily by Harbor Branch’s land-ocean biogeochemical observatory units, known as LOBOs. The fish assessments will include acoustic studies to determine if the dolphins are using passive listening or echolocation to find prey. (Protect Wild Dolphins Florida specialty license plate: $69,872 – 12/10/14 to 12/31/15)

**Epidemiology, Pathology & Population Health Science** – FAU Harbor Branch epidemiology research focuses on the health of IRL bottlenose dolphins as an indicator of the health of the ecosystem and potential implications for human health. Studies include assessments of mercury concentrations, the prevalence and patterns of antibiotic-resistant organisms and lobomycosis, zoonotic diseases, and the pathophysiology of stress. (Protect Wild Dolphins Florida specialty license plate: $207,787 – 1/1/14 to 12/31/15)

**Environmental Correlates of Habitat use by Manatees in the Harbor Branch Channel Using Advanced Technologies** – To assess environmental conditions accompanying thermal-refuge use by the endangered Florida manatee, as well as the use of advanced technologies to observe the species, FAU Harbor Branch scientists and engineers developed a program focused on the Harbor Branch channel, which is a common gathering space for IRL manatees particularly during winter months. Remote observation was complemented by a team of volunteer spotters.

**IRL Graduate Research Fellowships** – Proceeds from the Harbor Branch Oceanographic Institute Foundation’s 2014 Love Your Lagoon fundraising gala support seven competitively awarded graduate student fellowships focused on IRL research. Topics include seagrass restoration, algal blooms, pathogenic bacteria, and species diversity and interaction. (HBOI Foundation: $80,996 – 7/1/14 – 6/30/15)

**Outreach and Education:**

FAU Harbor Branch works to foster IRL research via the annual Indian River Lagoon Symposium, which it hosts and organizes as part of a multi-institution steering committee. The event attracts approximately 300 scientists, resource managers, and students, and provides a forum for all active researchers and agencies working in the IRL to share research findings and discuss challenges and opportunities. The program and abstracts are available at: [http://indianriverlagoon.org/symposium.html](http://indianriverlagoon.org/symposium.html).

The breadth of Harbor Branch IRL research is reflected in its public outreach efforts, which include the Ocean Science Lecture Series, a forum for Harbor Branch researchers and guest speakers to inform the public about their work; the Ocean Discovery Center, a museum-style visitor center that provides interpretations of Harbor Branch research and nearby marine environments including the IRL via a
continually evolving array of interactive exhibits, small live animal tanks, video, and other displays; and an IRL video that provides an overview of the estuary and some of the ways Harbor Branch is investigating its challenges (see www.youtube.com/watch?v=1v6KlaUA18Q&list=UU6YvxeMtnn-a5NhMKvk-Jg).

The IRL also is an integral part of the curricula for Harbor Branch educational programming, which includes Semester By The Sea, a semester-long undergraduate immersion in marine science; graduate student training for FAU students pursuing advanced degrees in biological and environmental sciences; the Harbor Branch Summer Intern Program, competitive program that attracts top undergraduate and graduate students worldwide for a 10-week immersion in marine science and engineering projects; the Marine and Oceanographic Academy, a magnet high school program located at Harbor Branch and created in partnership with the St. Lucie County School District; and the Indian River County Junior Scientists Fellows Program, a partnership with the Indian River Land Trust to engage high school students in the research and care of an environmentally sensitive, 185-acre preserve located along the IRL.
<table>
<thead>
<tr>
<th>Activity</th>
<th>Project Partners</th>
<th>CCMP Action Plan and Priority</th>
<th>Project Title and Abstract</th>
<th>CWA320 Funding FY 2014-2015</th>
<th>Project Deliverables</th>
<th>Project Start Date/Completion Date</th>
<th>Project Status</th>
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<tbody>
<tr>
<td>1</td>
<td>Marine Resources Council, Inc., St Johns River Water Management District</td>
<td>High (FSD-11) High (PIE-2)</td>
<td>Indian River Lagoon Program Education Coordinator &amp; Communication Plan. The Coordinator will administer the Education Program and the IRLNEP Communication Plan. will coordinate the activities of the IRLNEP Citizens Action Committee, organize the annual four-day lagoon summer training workshop for IRL region teachers, and coordinate the design of the annual IRL calendar photo contest. The Coordinator also produces and disseminates IRL and District information to the community at environmental educational events, brown bag lunches and public speaking events.</td>
<td>82,000</td>
<td>Delivery of public education and outreach presentations throughout the watershed, four-day teacher summer training workshop, production of the annual IRL Calendar.</td>
<td>10/1/2014: 9/30/2015</td>
<td>On Schedule</td>
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<td>2</td>
<td>Cape Canaveral Scientific Inc. (lead contractor); CAPTEC Engineering, Inc. (technical support); Scientific Environmental Applications, Inc. (technical support)</td>
<td>High (FSD-13) High (FSD-14)</td>
<td>Cape Canaveral Scientific Inc. 2014-2015 Grant Writing to Implement the IRLCCMP. This project assists local governments in meeting the challenges of financing CCMP implementation projects, and will pay for 5-grant applications during the year. The 16th year of support for this project continues to demonstrate the need of local governments to collaborate with state and federal agencies on implementation activities. Many local governments have used this service to fund capital improvement projects to implement CCMP action plans.</td>
<td>50,000</td>
<td>Delivery of five (5) competitive grant applications on behalf of local governments to help implement the IRL CCMP.</td>
<td>10/1/2014: 9/30/2015</td>
<td>On Schedule</td>
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<tr>
<td>3</td>
<td>University of Central Florida (lead contractor); Oak Hill Waterfront Committee (support); The Brevard Zoo (support); Anderson Rentals, Inc. (support); Citizen Volunteers</td>
<td>High (F-1) High (PIE-4)</td>
<td>Community-Based Living Shoreline Stabilization in Oak Hill, FL. The goals of this project are to reduce erosion and improve shoreline habitat at Sunrise Park in Oak Hill by constructing a living shoreline along 110 m of Mosquito Lagoon shoreline, and to engage the local community through education and outreach during the shoreline restoration.</td>
<td>29,566</td>
<td>Supporting documentation and final report detailing: construction of 110 m of community-based living shoreline restoration at Sunrise Park; completion of before and after restoration monitoring at Sunrise Park and control shoreline; community engagement, education and outreach during the living shoreline restoration.</td>
<td>10/1/2014: 9/30/2015</td>
<td>City did not accept award.</td>
</tr>
<tr>
<td>4</td>
<td>Florida Department of Environmental Protection; IRL Aquatic Preserve; Citizen Volunteers</td>
<td>High (W-5) High (W-6)</td>
<td>Indian River Lagoon Shoreline Restoration Project. The goal of the Shoreline Restoration Project from 1995-2013 has been to re-establish fringing mangrove habitat on public shorelines along the Indian River Lagoon, while promoting public education and awareness of mangrove habitat and its ecosystem benefits.</td>
<td>35,910</td>
<td>Supporting documentation and final project report on the IRL Shoreline Restoration Project activities for 2014-15</td>
<td>10/1/2014: 9/30/2015</td>
<td>On Schedule</td>
</tr>
<tr>
<td>5</td>
<td>Martin County (lead contractor); Florida Oceanographic Society (support); Citizen Volunteers</td>
<td>High (W-6) High (W-7)</td>
<td>Indian RiverSide Park Living Shoreline. This project will restore 200 feet of living shoreline at Indian RiverSide Park along the western shore of the Indian River Lagoon. Through a series of volunteer workdays trash and litter will be removed, oyster bags will be filled and deployed, concrete reef modules will be constructed and deployed, and native vegetation will be planted. These efforts will combine to increase the available habitat, to provide additional vertical relief, and to help bind the substrate.</td>
<td>15,000</td>
<td>Supporting documentation and final report detailing the restoration of 200 feet of shoreline at Indian RiverSide Park in Martin County.</td>
<td>10/1/2014: 9/30/2016</td>
<td>On Schedule</td>
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<td>6</td>
<td>The Brevard Zoo (lead contractor); University of Central Florida (technical support); Citizen Volunteers</td>
<td>High (F-1) High (PIE-4)</td>
<td>Community Outreach, Restoration and Monitoring of Intertidal Oyster Reefs in Mosquito Lagoon. Project goals are to increase the number of live oysters (Crassostrea virginica) in the Indian River Lagoon for filtration, denitrification, biodiversity protection, and substrate stabilization by continuing, and potentially completing, the scientifically-based and proven intertidal reef restoration ongoing in northern Mosquito Lagoon (Volusia County). Also, the Zoo will begin testing new methods to determine if oyster habitat can be created in areas in Brevard County where oysters are not currently present.</td>
<td>41,035</td>
<td>Quarterly and final summary report on the Community Outreach and Restoration of Intertidal Oyster Reefs in Mosquito Lagoon and Brevard county with copies of volunteer sign-up sheets and project photos.</td>
<td>10/1/2014: 9/30/2015</td>
<td>On Schedule</td>
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<td>7</td>
<td>Florida Fish and wildlife Conservation Commission (lead contractor); University of Florida (technical support); St Johns River Water Management District (technical support)</td>
<td>High (MON-1) High (IFF-1)</td>
<td>Molecular Tool Development and Implementation to Advance Monitoring of Pico- and Nano-Planktonic Algae In the Indian River Lagoon. The project goal is to develop tools to rapidly detect and quantify pico- and nano-planktonic algae responsible for harmful algal blooms in the Indian River Lagoon</td>
<td>49,769</td>
<td>Project final report, with supporting documentation, of molecular tool development and implementation to advance monitoring of Pico- and Nano-Planktonic algae in the Indian River Lagoon</td>
<td>10/1/2014: 9/30/2015</td>
<td>On Schedule</td>
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<td>8</td>
<td>City of Cocoa Beach</td>
<td>High (FSD-1), High (TMDL-1)</td>
<td><strong>Minutemen Streetscape and Stormwater Improvement.</strong> This project has several goals: reduce storm runoff and nutrient loading to the Banana River Lagoon; protect groundwater resources through low impact development (LID) methods and nutrient sorption media; comply with City’s adopted BRLBMAP, this project is #1 in first 5-year cycle; and to monitor LID and sorption media performance; then share results with lagoon stakeholders, EPA/FDEP and stormwater community at large.</td>
<td>35,000</td>
<td>Retrofitting of stormwater treatment channels and management areas along the Minutemen Causeway area of Cocoa Beach, utilizing Low Impact Development components.</td>
<td>10/1/2014: 9/30/2015</td>
<td>On Schedule</td>
</tr>
<tr>
<td>9</td>
<td>Florida Institute of Technology</td>
<td>High (F-3), Medium (FSD-6)</td>
<td><strong>Development of Bioremediation and Habitat Restoration Platforms to Improve Lagoon Water Quality, Restore Seagrasses, and Rebuild Bivalve Populations.</strong> The goals of this project are to develop and test prototype designs for floating bio-remediation and restoration platforms to improve water quality around areas with high nutrient input or sediment resuspension and in areas targeted for habitat restoration.</td>
<td>65,674</td>
<td>Quantitative assessment of the abundance, diversity, growth, survival, and migratory behavior of juvenile fishes in each of the project selected habitats, and the ultimate evaluation of nursery productivity of each habitat type.</td>
<td>10/1/2014: 9/30/2015</td>
<td>On Schedule</td>
</tr>
<tr>
<td>10</td>
<td>Marine Resources Council</td>
<td>High (PIE-1), High (PIE-2)</td>
<td><strong>Lagoon Life Savers: Working Together to Save the Indian River Lagoon.</strong> The goals of this project are: to launch Lagoon Leader Business Program to train business and industry leaders to adopt water pollution prevention and energy conservation best management practices; to launch Lagoon Lifesavers Education Corps Program Training Module; and hold MRC’s 15th American Assembly Focused on Priority Actions.</td>
<td>51,110</td>
<td>Successful launch of the Lagoon Leader Business Program, the Lagoon Lifesaver Education Corps, and holding the 15th American Assembly Focused on Priority Actions.</td>
<td>10/1/2014: 9/30/2015</td>
<td>On Schedule</td>
</tr>
<tr>
<td>11</td>
<td>Indian River Shores</td>
<td>High (PS-1), Medium (PS-2), High (FSD-10)</td>
<td><strong>Indian River Shores Seminole Lane Stormwater Baffle Box.</strong> The goal of this project is to substantially improve the quality of stormwater currently being released to the Indian River Lagoon from the Town's stormwater drainage system at Indian Lane through the installation of a Generation II Nutrient Separating Baffle Box.</td>
<td>65,211</td>
<td>Successful installation of a Generation II Nutrient Separating Baffle Box, project final report with supporting documentation of nutrient reduction, maintenance schedule.</td>
<td>10/1/2014: 9/30/2015</td>
<td>On Schedule</td>
</tr>
<tr>
<td>12</td>
<td>Indian River Lagoon National Estuary Program</td>
<td>High (PIE-1), High (PIE-4)</td>
<td><strong>Event &amp; Conference Sponsorship:</strong> IRL Symposium $2,500, American Assembly $2,500, IRL Envirothon $1,200</td>
<td>6,200</td>
<td>Sponsorship of the IRL Symposium; American Assembly, and the IRL Envirothon.</td>
<td>10/1/2014: 9/30/2015</td>
<td>On Schedule</td>
</tr>
<tr>
<td>13</td>
<td>Indian River Lagoon National Estuary Program</td>
<td>High (FL-1), High (FL-2)</td>
<td><strong>Program Operation Costs:</strong> Travel $7,500; Legal Advertising $500; Printing $2,100; Office Supplies $425; Field Equipment &amp; Tools $1,000</td>
<td>11,525</td>
<td>Program required travel; legal advertising; printing; office supplies; field equipment &amp; tools.</td>
<td>10/1/2014: 9/30/2015</td>
<td>On Schedule</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>538,000</strong></td>
<td></td>
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</tr>
</tbody>
</table>
**Section C.3. IRLNEP Clean Water Act Implementation**

The IRLNEP CCMP established under Section 320 of the Clean Water Act (CWA) and in compliance with the CWA has developed partnerships with federal, state and local governments, non-profit organizations, academia and the IRL region citizens. These partnerships form the framework for consensus, ecosystem based management strategies designed to restore and maintain IRL water quality and habitat.

The FY 2015-2016 IRLNEP Work Plan directly or indirectly supports all of the CWA core programs. Highlighted in this section is a specific example of a projects implemented in the IRL basin that directly relates to CWA.

**Activity 11**

**Grants Writer/ Facilitator.** The project is funded entirely by the IRLNEP as a mechanism to assist local governments in meeting the challenges of financing projects that implement the IRL CCMP. Many local governments have utilized the services of the IRL NEP grant writer to identify new funding sources, prepare grant proposals and join with other partners to help implement CCMP Action Plans.

This project directly supports the IRL NEP goal to identify and develop long-term funding sources to implement CCMP prioritized projects. Without offering grant writing assistance to IRL local governments via this project, it is highly unlikely that these activities would be completed.

**Clean Water Act Implementation Information**

IRLNEP has a primary role in this project. This project directly supports the objectives of the CWA to restore and maintain the chemical, physical and biological integrity of the Nation’s waters and to control point and non-point sources of pollution. The grants writer has submitted to the Florida Department of Environmental Protection Clean Water Act Section 319, state TMDL, SJRWMD Cost Share Program, and Florida Governor’s Water Projects legislative funding applications for projects that include the development of stormwater parks, and installation of treatment train methodology systems in older, highly urbanized areas.
C.4. Discussion of External Factors Impacting the IRL NEP FY 2015-2016 Work Plan Implementation

At the present time IRL NEP FY 2014-2015 Work Plan projects are being implemented on schedule and within budget and the IRL NEP staff is in continuous communication with the project leads to insure outcomes are achieved and tasks are met.

In 2015, the State of Florida is rebounding from the economic downturn of 2008-2012, and tourism and the housing industry are continuing to comeback. These are the two primary revenue sources for the state generated through sales tax and property tax collections. Florida does not have an individual income tax. With increasing revenues the state legislature may allocate additional funds to the IRL in 2015 in an attempt to address many of the concerns of the past year. The majority of projected state funds are targeted to the southern IRL and Everglades restoration projects. Some funds have become available for environmental muck dredging in the central IRL and Eau Gallie River tributary.

A summary of continuing FY2014-2015 work plan projects is included as Section C.2 and precedes this narrative.

Other notable achievements include on-going support by the Program for several volunteer-based habitat enhancement projects, research into the sources of nitrogen to the lagoon, and several on-going education and outreach projects throughout the watershed.

In addition, the IRL NEP continues to work with the St. Johns River Water Management District (SJRWMD) and the Indian River Lagoon Protection Initiative (IRL-PI) to improve the management, protection, restoration and sustainable uses of the lagoon. The IRL-PI includes four capital projects within the SJRWMD’s portion of the IRL and the Indian River Lagoon Algal Blooms Investigation (IRL-ABI).

The main concern is that the IRL system is becoming eutrophic. Eutrophy, in the case of the IRL system, would likely cause a shift to a phytoplankton-dominated system, with reduced seagrass cover and diminishing fisheries. For example, blooms in 2011 led to a loss of approximately 45% of the acres of seagrasses mapped in 2009, and a map prepared in 2013 documented only a 12% recovery. The IRL-ABI is progressing toward its goal of improving (1) documentation of nutrient loads entering the lagoon and acting as “bottom-up” controls of phytoplankton blooms; (2) knowledge of uptake, storage and release of nutrients by key primary producers; (3) insights into the physiology of phytoplankton species responsible for the recent blooms; and (4) an understanding of grazing pressure from various consumers and its potential to act as a “top-down” control on phytoplankton blooms.

In April 2014, the IRL NEP Advisory Board recommended the creation of a new entity to sponsor the IRL NEP, in hopes of elevating the program and garnering increased funding and support for CCMP implementation. In February 2015, the IRL Council was formally created as an independent special district of Florida. The Council will become the sponsor of the IRL NEP, effective on or before October 1, 2015. During the transition process, the current host (St Johns Water Management District) has continued to provide program support with staff, administrative services, and facility space.
### Section D. Clean Water Act Travel Funds

#### Indian River Lagoon National Estuary Program FY 2014-2015 Travel Cost

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Travel Dates</th>
<th>Purpose</th>
<th>Location</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ronald Brockmeyer</td>
<td>11/1/2014 to 11/6/2014</td>
<td>7th National Summit on Coastal and Estuarine Restoration (RAE)</td>
<td>National Harbor, MD</td>
<td>$1,245.40</td>
</tr>
<tr>
<td>Charles Jacoby</td>
<td>11/6/2014 to 11/7/2014</td>
<td>Deliver lecture on the Indian River Lagoon</td>
<td>Melbourne</td>
<td>$125.91</td>
</tr>
<tr>
<td>Charles Jacoby</td>
<td>11/13/2014 to 11/14/2014</td>
<td>Participate in a meeting of STIRLEN</td>
<td>Vero Beach</td>
<td>$125.91</td>
</tr>
<tr>
<td>Charles Jacoby</td>
<td>11/19/2014 to 11/20/2014</td>
<td>Participate in a meeting of the IRLNEP Design Team, deliver a lecture on the Indian River Lagoon</td>
<td>Palm Bay, Bethune Beach</td>
<td>$122.13</td>
</tr>
<tr>
<td>Charles Jacoby</td>
<td>12/16/2014 to 12/19/2014</td>
<td>Participate in a meeting of the IRLNEP Advisory Board, liaise with the Smithsonian Marine Station regarding contracts, participate in the Steering Committee for the Indian River Lagoon Symposium</td>
<td>Palm Bay, Fort Pierce</td>
<td>$407.67</td>
</tr>
<tr>
<td>Charles Jacoby</td>
<td>2/10/2015 to 2/12/2015</td>
<td>Participate in the IRL NEP request for proposals, deliver a lecture on the Indian River Lagoon</td>
<td>Palm Bay, Daytona Beach</td>
<td>$281.57</td>
</tr>
<tr>
<td>Frank Sakuma</td>
<td>2/22/2015 to 2/26/2015</td>
<td>EPA and ANEP annual meeting</td>
<td>Washington D.C.</td>
<td>$1,876.63</td>
</tr>
<tr>
<td>Charles Jacoby</td>
<td>3/26/2015 to 3/27/2015</td>
<td>Participate in meetings regarding the Indian River Lagoon at Bethune-Cookman University and the Marine Discovery Center, participate in a meeting of the IRL Council</td>
<td>Daytona Beach, New Smyrna Beach, Palm Bay</td>
<td>$164.08</td>
</tr>
</tbody>
</table>

Total $4,349.30

#### Indian River Lagoon National Estuary Program FY 2014-2015 Travel Cost (Estimate to end of FY)

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Travel Dates</th>
<th>Purpose</th>
<th>Location</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charles Jacoby &amp; Frank Sakuma</td>
<td>Multiple Dates/Summer 2015</td>
<td>Attend meetings and provide presentations as required</td>
<td>Multiple</td>
<td>$3,150.70</td>
</tr>
</tbody>
</table>

Total $7,500.00